Improving the achievements of non-traditional students on computing courses at one wide access university

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This work or any part thereof has not previously been presented in any form to the University or to any other body whether for the purposes of assessment, publication or for any other purpose (unless otherwise indicated). Save for any express acknowledgments, references and/or bibliographies cited in the work, I confirm that the intellectual content of the work is the result of my own efforts and of no other person.

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Abstract

This longitudinal study set out to improve the retention and achievements of diverse students on computing courses in one wide access university, firstly by early identification of students at risk of poor performance and secondly by developing and implementing an intervention programme. Qualitative data were obtained using the ASSIST questionnaire, by focus group discussions and an open-ended questionnaire on students' experiences of the transition to higher education (HE). Quantitative data on student characteristics and module results were obtained from Registry. Statistical analyses were performed using SPSS version 10.

The study comprised two phases where phase one sought to enable the early detection of students at risk of poor performance by investigating the data set for patterns that may emerge between student achievement at Level 1 and entrance qualification, feeder institution, approaches to learning, conceptions of learning, course and teaching preferences and motivation. Phase one findings showed a trend of poorer performance by students who entered computing courses in HE with an AVCE entrance qualification. It was also shown that mature students scored more highly on the deep approach scale compared to their younger counterparts. Phase two investigated the data set for patterns that may emerge between student achievement at Level 2 and entrance qualification, approaches to learning, conceptions of learning and course and teaching preferences.

Phase two, using action research, also sought to develop an intervention programme from the findings. This intervention programme was designed to improve aspects of information delivery to students; the personal tutor system, assessment régimes,

Welcome Week, and teaching and learning. Piloting, evaluation and refinement of the intervention programme brought changes that were seen as positive by both staff and students. These changes included the Welcome Week Challenge which involved students in activities that sought to enhance students' interactions with peers, personal tutors and the school and university facilities.

These findings have shown that, for staff in wide access HE institutions, some knowledge of the previous educational experiences of their students, and the requirements of those students, are vital in providing a smooth transition to HE.

A model of the characteristics of a successful student on computing courses in HE and a model for enhanced retention of diverse students on computing courses in HE were developed from the research findings. These models provide a significant contribution to current knowledge of those factors that enhance a smooth transition to HE and the characteristics of a successful student in a wide access university.

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1. Introduction

The University of Wolverhampton (UoW) is committed to widening participation with over 43% of students coming from social classes C2, D and E (Arnot, 2001). In the School of Computing and Information Technology (SCIT), less than 50% of the student intake for the last five years had A level qualifications, and the University is number one in England, in the league table of institutions attracting students from working class backgrounds. The university is the main provider of tertiary education for the local, multi-cultural population. In line with other wide access institutions, SCIT has recognised the importance of improving their provision and addressing the needs of students from diverse backgrounds in order to enhance the learning experience as well as the retention and progression rates for their students.

During this research programme from 2002–2005, the University had been undergoing a program of reinvestment in new buildings and facilities and SCIT moved from its previous location into a purpose-built 'Technology Tower' in summer 2005. It was anticipated that this building would offer staff and students improved facilities for teaching and learning and its central position on the main campus would enhance students' access to the Learning Centre, the Students' Union, the canteen and other social areas.

In this study a cohort of students was tracked from their final year in local FE colleges through Levels 1 and 2 on Computing or Computer Science courses in HE. The number of students in FE was small, so the entire cohort in HE at Levels 1 and 2, was included for analysis. The students were surveyed using the ASSIST questionnaire, which is discussed in detail later (see Chapter 3, Section 3.1, and Appendix (i)) in order to investigate their approaches to learning, course and teaching preferences and understanding of learning. Their end of year results were incorporated onto a database, as were their personal characteristics and previous educational details. The data were analysed statistically and investigated for patterns that may emerge between entrance qualifications, previous educational institution, teaching and learning preferences, learning styles and performance in Level 1. Qualitative data on the students' experiences of the transition to HE and studying at Level 1 were obtained by focus group discussions and short questionnaires with students. Staff in FE gave informal interviews on the nature of courses studied at their institutions for entry in to HE. Leaders of Level 1 modules in HE were interviewed a view to identifying ways to improve student performance.

Part of this study involved identifying students' approaches to learning. Research identifying deep and surface approaches to learning originated in Sweden with Marton and Säljö's (1976) study where students were asked to read several sections of text from a book and answer questions designed to assess what the students had understood. The results showed two distinct ways in which students set about learning. On one level, it was found that some students focussed on learning the actual text such that it could be reproduced, in a manner known as rote learning. On another level, some students set about trying to understand the meaning of the text; attempting to comprehend what the author wanted to say about the subject. These two levels of processing became known as surface and deep approaches to learning and related to the different aspects of the learning material that were focussed on by the student. It was emphasised by Biggs (1999) that it was important to note that these were not characteristics of the students, but rather the approach a student takes to a particular task. Generally, a surface approach was taken by a student on occasions when they felt the requirement of the learning activity was factual recall; when time was limited; when a student had a poor understanding of the topic; when a minimum pass was all the student required to achieve and when a student was not well motivated. Surface approaches may well lead to high levels of achievement by students in assessments if the assessment tasks were geared to rewarding factual recall rather than understanding. A deep approach is generally taken by a student who has a desire to understand the topic; is well motivated; has a sound knowledge base and a desire to abstract meaning. Assessment tasks that require a deep understanding of the topic use higher level verbs such as ‘reflect’ and ‘hypothesise’ and encourage students to take a deeper approach.

Whilst memorisation is often linked to a surface approach, Webb (1997) argued that it is only a characteristic of a surface approach if understanding was the requirement of the task. Memorisation can be highly appropriate when learning poetry or formulae. Webb (1997) went on to point out that in many Asian cultures, the practice of repetition or memorising is used to develop a deep understanding. Clearly the distinctions of the characteristics of deep and surface approaches to learning are not clear cut, but more embedded in the intentions of the student towards a particular task, and the reasons they have for adopting particular ways of learning.

Students on computing courses are expected to develop knowledge and understanding of operating systems and the principles behind them. Problem solving and analytical skills are also subject specific outcomes for many modules as well as application of theory to practical problems. The ability to analyse questions to determine appropriate solutions are skills required by employers recruiting graduates with degrees in Computing and Computer Science. Students are more likely to develop these skills when they are encouraged to use the full range of learning activities which involve students in activities such as reflecting, applying, relating and hypothesising. These verbs are associated with a deep approach to learning (Biggs, 1999).

This study sought to improve the achievements of non-traditional students in HE. Achievement, however, may mean different things to different people. For members of staff, it is likely to mean higher numbers of students achieving the appropriate learning outcomes. For students, achievement may, for some, be related to the degree classification achieved at the culmination of the course. To other students it may be more about avoiding failure or achieving small, personal milestones along the way. There is also the sense that, to have studied in HE is an achievement in itself with value-added emerging from widening participation. The quality of their experience is likely to impact on the value a student attaches to that particular achievement. By seeking to improve the quality of the experience of HE, it was hoped that the student's sense of achievement would be enhanced.

There is an extensive range of published literature on student retention and the first year experience in HE, and many issues are likely to be common to any HE institution, especially those embracing widening access. It is also possible that some issues might be subject or institution specific or may be related to student background. Napier University in Scotland, which embraces a policy of wide access, initiated a Student Retention Project (SRP) in 1994 that rolled over for the next six years until becoming core funded. The SRP has evolved to concentrate on research and stimulating institutional change whilst continuing to provide evidence of the academic performance of different groups of students; identifying a range of factors that place students at risk of withdrawal or failure and worked to change the attitudes and working practices of staff (Johnston, 2003). Whilst the research at Napier University focussed on the teaching and learning and student support areas to a greater extent than the work described in this thesis, there was the common notion that a research led approach was crucial to realising what kind of interventions realised the greatest benefits whilst improving retention and without lowering standards.

The work at Napier University also included the development of a Diagnostic Test to help identify those students at risk of failing to progress to the second year of their programme (Johnston, 2000). This differed slightly from the attempt made in this thesis to identify, at the earliest opportunity, those students at risk of poor performance at Level 1.

Another wide access institution, the University of Teesside (UoT) established a retention team in 2003 which explored issues relating to the retention of non-traditional students. The UoT research identified three crucial points that were difficult for students which were:

- university transition points (entry, progression etc);
- assessment points;
- external influences (family, health etc).

These factors were also identified, in the work in this thesis, to be difficult points for students. Comments made by students from UoT and the UoW on the subject of the problems encountered in the transition to HE were found to be remarkably similar indicating that many of the issues were neither institution nor subject specific. The work at Napier University focussed rather more on retention than the work in this thesis, but nevertheless identified six areas that were similar in nature to those identified in this thesis as areas where intervention could lead to an enhanced student experience in HE. These key areas were:

- identify and implement strategies for encouraging social interaction between students;
- identify and implement specific support and contact arrangements for part-time students;
- enhance feedback to students, not just on summatively assessed work;
- develop tailor-made induction for part-time and postgraduate students;
- identify and address key issues with timetabling;
- identify and address key issues with communication;
- increase the resources available to support retention strategies.

It was interesting to note the similarities between the projects at the UoT and UoW, which had run concurrently and thus were unable to take account of each other, as both had collected data and feedback from both students and staff. The work at the UoT is set to continue for two more years and will conduct further development work in relation to these ongoing initiatives, taking into account feedback from students and reflection by key staff involved in implementation (Nutt, 2005).

1.1 The Research Questions

1.1.1 What is the influence of the entrance qualification and feeder institution on a student's approach to learning?

1.1.2 What is the significance of these factors on students' achievement in their first year in higher education?

1.1.3 To what extent can the information obtained from questions 1 and 2 be used to develop appropriate interventions to enhance student learning in the form of learning support and changes to teaching and assessment?

1.1.4 Can a theoretical model that identifies the characteristics of a successful student be developed from the research findings

2 Critique of literature

2.1 Background

The University of Wolverhampton is a former polytechnic, wide access institution with a diverse range of students, many of whom are drawn from the local multi-cultural community. The institution is split over several campuses, with some being in adjacent towns, but the School of Computing and Information Technology is situated in the main, city centre campus, and is due to move into a new, purpose built Technology Tower in July 2005. Currently the University is number two in the UK league table (number one in England) of universities attracting working class students (source HEFCE, 2004). University-wide, 45% of students are from working class backgrounds (HEFCE, 2004) and the University scored a full 6/6 for "value added" according to The Guardian League Tables (2004).

The Government has set a target of 50% participation by 18 – 30 year olds in HE by the year 2010, and in order to reach this, more and more HE institutions are embracing widening access policies to attract students from low-participation groups. Figures from the Higher Education Funding Council for England (HEFCE, 01/62, 2001) show that participation increased from 15% in 1988–1989 to 30% in 1993–1994, mainly due to increased participation by 18–21 year olds. Growth in participation rates slowed to 6% from 1996-1997 to 2000-2001 indicating that further efforts will need to be made if the Government's target is to be met. Not all the growth in the sector is due to 'new' students embarking on HE courses, many professional qualifications such as nursing and teaching are now graduate courses, which has inevitably led to changes in participation levels and the groups represented in HE (Farwell, 2002).

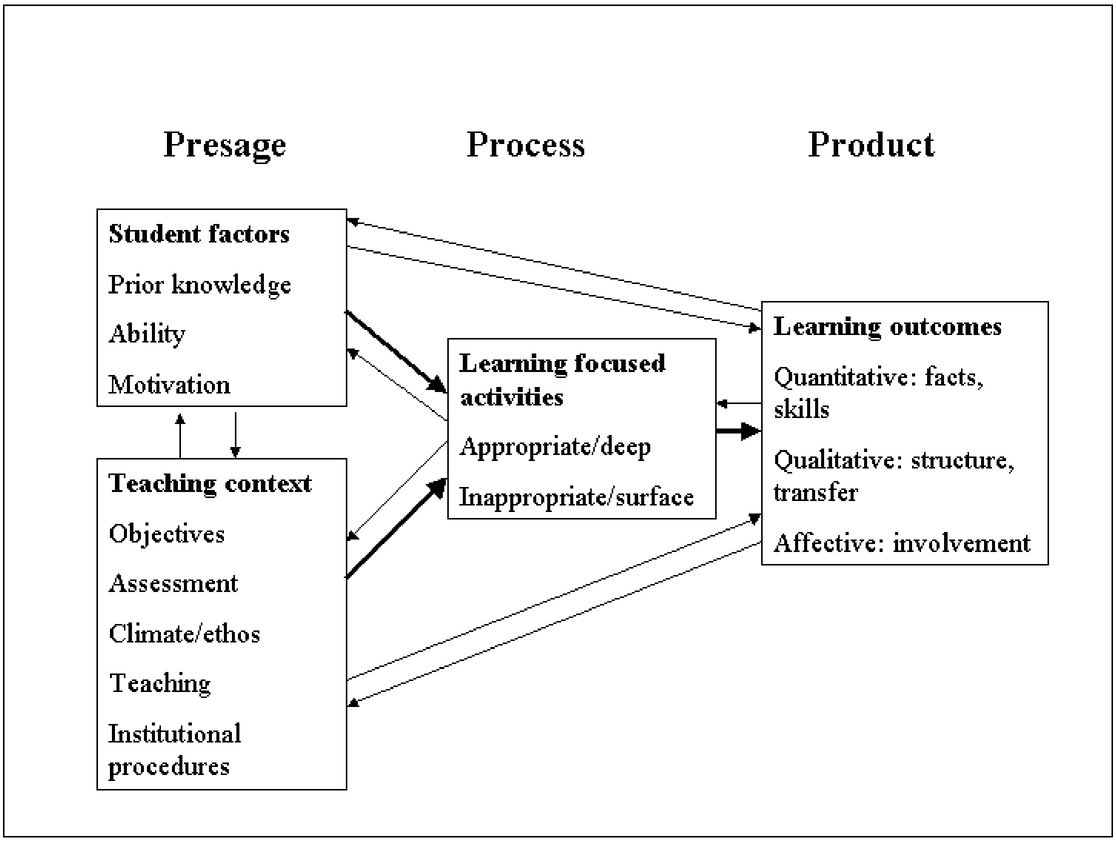
There is evidence, according to David (2005), that the massive expansion of HE has tended to increase opportunities for all students, on a relatively differentiated basis in relation to social class, and that one of the key features to this expansion has been the increasing proportion of females in the student body. By 2004, the proportion of female students in British universities had risen to 54% (THES, March 2005), and David (2005, p. 3) stated: "Thus the expansion of universities can be seen to have relied upon the new middle classes and especially women rather than the working classes". There is a tendency, according to Scott (2001), for students from lower socio-economic groups to be concentrated in the new and less prestigious institutions, many of which are former polytechnics, situated in large urban conurbations. The drive for HE institutions to provide wide access is thought to have been a factor in reduced recruitment in new institutions, as more prestigious institutions now select students that they would formerly have rejected. Many new institutions seem to be facing further change in order to survive and will need to be innovative to attract new learners into HE to maintain their student population (Farwell, 2002). Bamber and Tett (2000) found that there was, however, little value for HE institutions in attracting students on to courses if they subsequently dropped out of their studies and stated: "there is a clear correlation between increasing access to poorer students, and higher drop-out rates" (Bamber and Tett, 2000, p. 57). This clearly demonstrates the need to see the provision of access as part of a larger picture that also includes retention, progression and achievement.

2.2 Introduction

This work began in order to improve the achievements of non-traditional students on computing courses at one new university. Students enrol on these courses with a range of entrance qualifications including A levels, vocational A levels (AVCE), GNVQ, BTEC, Access, HND and overseas qualifications. These diverse ranges of entrance qualifications and prior experience are likely to mean that there is a wide range of student factors that influence the student learning experience in HE.

Biggs' (1999) 3 P model of learning and teaching (see Figure 1), based on Dunkin and Biddle's (1974) linear model of teaching, shows that student factors are one of two kinds of presage factors, the other one being the teaching context, that interact at the process level of the model (Biggs, 1999, p. 18). The process level is where the learning-related activities take place, which in turn determines the learning outcome, or product, achieved by the student. Student factors in the 3 P model are seen as prior, relevant knowledge of the subject or topic, the student's ability and student motivation. The factors in the teaching context shown in the model are, the subject, topic or skill that is intended to be taught, the way in which it will be taught and assessed, the skill and expertise of the teacher and the ethos of the institution and classroom. The 3 P model shows that: "these factors interact at the process level to determine the student's immediate learning-related activities, as approaches to learning" (Biggs, 1999, pp. 18 – 19).

Figure 1. Biggs' (1999) 3 P model of teaching and learning (Biggs, 1999, p. 18)



This literature review analyses the current theories and practices relating to widening participation, the approaches to learning adopted by students, teaching and learning, assessment and feedback régimes, student expectations and motivation and student support.

2.3 Computing and computer science

Courses in Computing and Computer Science are offered in both full time (sandwich) and part time modes as BSc (Hons) degree, and HND at this University. Computing leads to employment in areas such as systems analysis, programming, application programming, the development of computerised systems and database administration. Specialist routes are offered in information systems or multimedia. Computer Science leads to employment in software development and the application of computer systems to a range of organisations. Software and hardware support specialist, programmer, WWW systems developer or computer network specialist are some roles for those with this particular qualification, though there are specialist routes available in software engineering and games development. As a relatively new subject area, first offered in the 1960s (Boyle *et al.*, 2002), technological advances mean that parts of the subject have to be constantly revised in order to remain up to date, and the syllabus is very broad. According to Boyle *et al*. (2002) the subject is unusual in that a large proportion of academics have a first degree in another subject, which may be related to the relative newness of the subject or for other reasons that are unclear. The subject area flourished until around the turn of the century but has since undergone a change in fortune with reduced recruitment, problems retaining students and a reduced job market frequently blamed on outsourcing, off-shoring and the 'dot com bubble' (McGettrick *et al.*, 2004, and Irons and Alexander, 2004). McGettrick *et al.* (2004) also found that the media tended to promote a negative image of computing as it frequently reported disaster stories involving viruses, SPAM and security issues rather than success stories and stated: "Yet society is ever more dependent on computers and computing, and this dependence will only increase in importance over time" (McGettrick *et al.*, 2004, p. 1).

Unlike most other disciplines, there are few specific entry requirements for Computing and Computer Science courses (Boyle *et al*., 2002; Irons and Alexander, 2004 and McGettrick *et al.,* 2004) with most institutions requiring three A levels and a certain level of mathematics. For wide access institutions, a greater range of qualifications enables students to enter HE, with this particular institution requiring two A levels, one double award AVCE, Scottish Highers, BTEC national certificate/diploma or 'Access to HE' award. English and Mathematics at GCSE grade C are also required.

Many students may be intrinsically motivated to study computing subjects, but there is also considerable support for the theory that:

> "..it is often the case that students choose computing as a 'meal ticket' to well-paid jobs rather than from personal interest or motivation, and without sound understanding of what the course entails" (Irons and Alexander, 2004, p. 8).

Boyle *et al*. (2002) noted that Computer Science involves an unusual syllabus and that computer programming in particular is a significant challenge to students, hence the expectations of a student with a qualification in Information Technology (IT) may not be accurate. This concurred with McGettrick *et al.* (2004) who also found that programming was often viewed by students as: "dry, uninspiring drudgery rather than a creative and inspiring pursuit" (McGettrick *et al.,* 2004, p. 12). Boyle *et al*. (2002) reported that changes to pre- and post-16 mathematics to a 'breadth not depth' régime meant that topics relied upon by computer science have been dropped or reduced. "The precise value of pre-university Computer Science qualifications, and of pre-university 'experience' are things that we would like to gauge" (Boyle *et al*., 2002, p.7). McGettrick *et al.* (2004) recognised the importance of creating awareness among prospective HE students in computing subjects of the careers in industry and commerce that lead on from computing, and to:

> "Create for students a smooth transition from school to university by enthusing and informing potential students and by creating a positive influence affecting pre-university computing" (McGettrick *et al.*, 2004, p. 18)

Computing and Computer Science are not generally seen as attractive subjects to women with the percentage of women on computing courses at this institution being 20% of the cohort. This is in line with the DTI figure of 20% women in computing education (DTI, 2003). McGettrick *et al.* (2004) reported the gender imbalance in computing subjects and suggested that reasons need to be understood and verified to ensure that those entering computing form a representative cross section of society. One reason given for this gender imbalance is that Computer Science is generally perceived as mathematical, techie and nerdy (Turner, 2005) with women opting for business orientated courses instead. Turner (2005) found that social conditioning and the media are responsible for this attitude by generally depicting males engaging with technology from a position of power with females seen as decorative or sexual objects accompanying the technology and stated: "the message these adverts sent to the general public was that women are not confident with technology, and have no status or power around computers" (Turner, 2005, p. 5). Irons and Alexander (2004) reported that the low proportion of females participating in HE computing subjects is not a worldwide phenomenon, but may be linked to a 'macho' culture among students and lecturers which some women find discouraging, and stated: "Women's under representation is not due to direct discrimination but to subconscious behaviour that perpetuates the status quo" (Irons and Alexander, 2004, p. 16).

As a major contributor to the UK economy, computing must recruit and retain students as technology, and its use in industry and commerce, is likely to increase in the future. There is, therefore, a need to offer a wide range of exciting and rewarding courses and careers in computing that will meet the needs of a wide range of students including those currently underrepresented. This, according to Irons and Alexander (2004, p. 16) "will require a culture shift in many departments, and a strategic approach to improve services for students". McGettrick *et al.* (2004) also reported that the pace of technological change is unlikely to diminish and stated:

> The pervasive nature of computing and the broad range of uses and applications suggest that there must be opportunities for students from a wide variety of backgrounds and with vastly differing skills to find challenging and attractive opportunities to study computing" McGettrick *et al.,* 2004, p. 7).

2.4 Transition and retention

Modern universities, especially, have found that large numbers of students now come from non-traditional backgrounds, and wide access institutions have found that there are difficulties associated with supporting and fostering learning where students' prior educational experiences are very varied (Bamber and Tett, 2000; McInnis, 2001 and Zeegers and Martin, 2001). For most institutions the successful transition to HE study hinges on using the first year of a degree course as a time for students to adapt to the styles of teaching and assessment required in tertiary education, and many studies (e.g. McInnis, 2001) have been conducted on the first-year experience in order to improve the transition into HE for students. Providing the access to HE is of fundamental importance, but Allen (2001, p.16) stated: "so is ensuring that existing students graduate". Allen (2001) noted an argument for shifting the emphasis towards retention and achievement rather than access. Retention and achievement could be helped by flexibility and adaptability in teaching, which would generally improve the learning experience for students from non-traditional backgrounds and those with disabilities. Many of the non-traditional students come from supportive further education (FE) environments and often feel lost and abandoned in the large lectures and the vast buildings common to HE institutions. There are problems in Australia, similar to those in the UK, associated with the transition to, and retention in HE. An Australian study (Zeegers and Martin, 2001) set out to address the problem of first-year student failure and withdrawal, which had increased with increased participation. The study was based on previous studies by the same authors, which had shown that difficulties encountered were curriculum overload, perception of poor teaching, loss of interest in the area of study and inadequate advice on academic problems. It was felt that incoming students were poorly prepared for HE and may not be willing to persist when they encountered difficulties. Bamber and Tett (2000) reported that some students had to confront negative attitudes towards their study from friends, parents and partners. Supportive parents or partners were a positive boost. Those students without this support carried an additional burden during their studies. Connor *et al.* (2001, p. 7) stated:

> There is a need especially in the first few months, for institutions to focus more on possible mismatches between students' expectations and their initial experiences of both academic and student life issues.

It could be argued that this goes back to entry or pre-entry information and maybe FE could include more help and advice on HE. Perhaps the onus is on the HE sector to go into FE to a greater extent, to offer advice and guidance to prospective students. Archer and Hutchings (2000) noted a ‘poverty of aspiration’ among working-class groups, who are often steered towards employment rather than to HE, and that the combined pressures upon these students put them at greater risk of non-completion. Goddard (1999), reporting on a study from Warwick University, found that male students from areas of high unemployment were more likely to drop out of university than those from more affluent areas. It was thought that their aspirations may have been more influenced by local unemployment rates, and studying may seem futile if unemployment was the likely result. Few articles generally gave little advice on expectations and aspirations and how to address these issues.

Supporting students whose prior educational experience is very varied has provided significant challenges to HE institutions. Several studies (Abramson and Jones, 2001; Lowe and Cook, 2003 and Yorke and Thomas, 2003) noted that many non-traditional students were poorly prepared for HE study. It was, however, pointed out by Rhodes and Nevill (2004) that it is insufficient to merely provide access to non-traditional students, they must also stay, progress and be successful. Lowe and Cook (2003) noted that the abrupt shift from the controlled environment in school or college to the autonomous learning required in HE created anxiety and stress in students. A high correlation between level one non-completion and the level of student preparedness for teaching and learning in HE was found by Abramson and Jones (2001) who noted: “A GNVQ student from an environment of 30 plus hours class contact and highly prescribed teaching will find the transition to autonomous learning and six hours class contact time a very difficult one to make without considerable support and guidance" (Abramson and Jones, 2001, p. 36). On the transition to HE, Zeegers and Martin (2001, p. 36) stated:

> …commencing students are, in general, poorly prepared for the tertiary experience and may not be willing to persist when they encounter difficulties.

Since most of those who leave their courses do so during, or at the end of, Level 1 (Ozga and Sukhnandan, 1997), it means that this is the level where institutional focus is required in order to retain more of these students. Earwaker (1992) reported that students are particularly vulnerable at the start of their courses, and that counsellors and advisors agreed that students need more support in the first year. According to Ozga and Sukhnandan (1997), research has linked the likelihood of dropping out partly to a mismatch between younger applicants' prior expectations of HE and the reality of university life and partly to greater family and financial pressures among mature students. A lack of social integration was found to be a source of dissatisfaction for students with doubts about undergraduate life. Difficulties in forming friendships, becoming part of a student group and participating in university social life were noted as problems for some (Mackie, 2001). Students' expectations of university life were often not matched by the reality of sorting out timetables, finding out what was required of them and adjusting to having to take responsibility for their studies (Mackie, 2001). Tinto (1993) described the type of academic and social integration that was considered necessary for students to achieve a sense of belonging to their institution. This was more easily achieved when most students lived on campus, but may be considerably more difficult now, when many students are drawn from the local community and live off campus.

To ease the transition from school/FE into HE, Cook and Leckey (1999) found that it was essential for staff in HE to have an informed view of the diversity of backgrounds, needs and aspirations of their students. It may also be beneficial for student expectations to be understood.

> To achieve this [a smooth transition into HE] there needs to be a greater awareness among academic staff of the qualities and skills which new students bring to their university studies as well as explicit statements of those qualities and skills which are desirable to assist new university students to study effectively (Cook and Leckey, 1999, p. 170).

As vocational qualifications now form a significant percentage of all entrance qualifications to HE courses, it is important to address not only how well or poorly prepared these students are for HE study, but how well prepared the HE institutions are to cater for the requirements of these students. MacDonald and Stratta (2001) found that staff tended to place the emphasis on helping students to adjust to the existing undergraduate provision rather than engaging in a radical re-think on possible approaches more appropriate to a more diverse student population. Biggs (1999, p. 21) noted: "level 1 teachers thought that differences in learning were due to differences in students' ability, motivation and other student-related factors". In a study of staff perceptions of factors related to student non-completion in HE, Taylor and Bedford (2004) reported similar findings where staff thought that remediation of students' perceived deficiencies would solve the problem of managing student diversity and stated:

> This view matches well with the generalised opinion of staff in this study that initiatives to address non-completion should focus on helping students to change, rather than changing our course design,

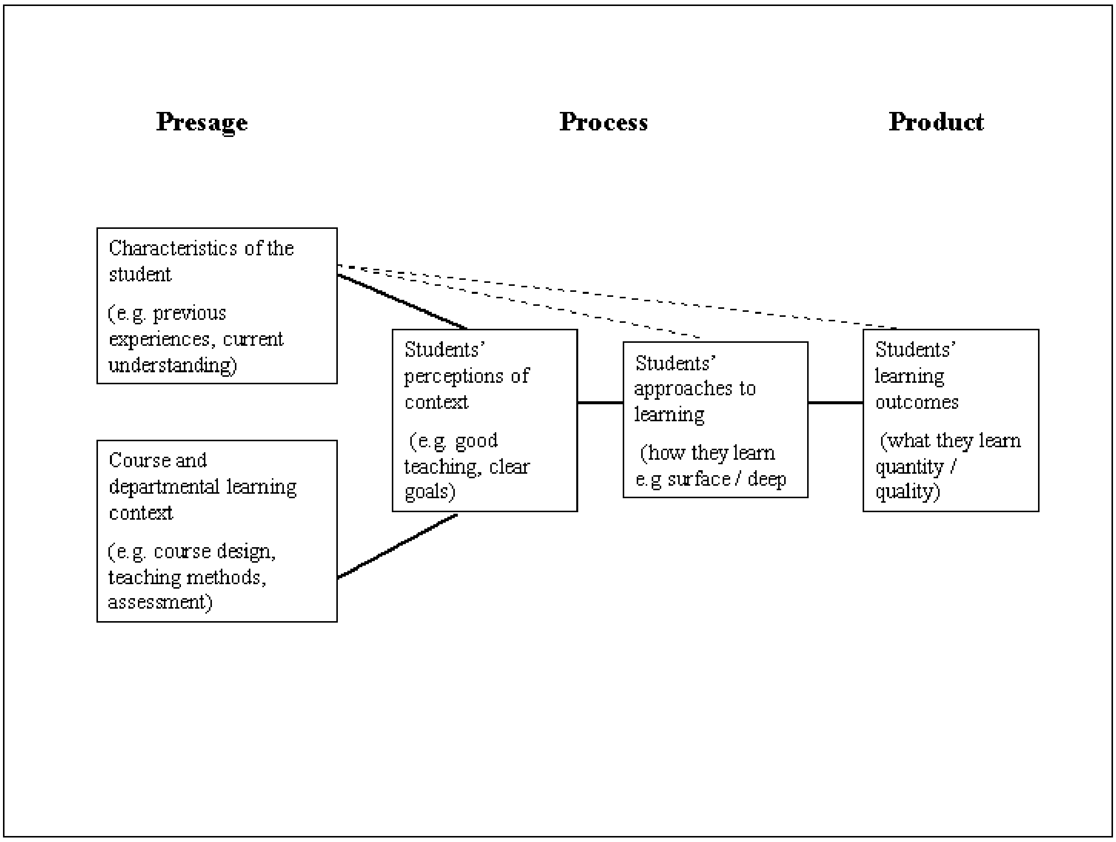
> teaching or institutional practices (Taylor and Bedford, 2004, p. 390).

A modernised approach to learning will, according to Marks (2000), need to be determined by the needs of the learner, not what suits the provider. From a similar perspective, Laing and Robinson (2003, p. 184) stated:

> A more appropriate model of non-completion must give greater attention to the underlying nature of an institution's teaching and learning environment, the manner in which this environment influences student non-completion and the student perceptions and expectations that are generated by this environment.

This is consistent with Biggs' (1999) 3 P model of teaching and learning, which shows how student factors interact with teaching context factors at the process level to determine the students' approaches to learning. Changes to student presage factors, brought about by increasing diversity would be better addressed by appropriate changes to the teaching context, rather than expecting the students to change. Another version of the 'presage-process-product' model was put forward by Prosser and Trigwell (1999). This model (see Figure 2) separated out student perceptions of the context and showed them to be "an interaction between their previous experiences of learning and teaching and the learning and teaching context itself" (Prosser and Trigwell, 1999, p. 12).

Figure 2. Presage-process-product model of student learning (Prosser and Trigwell, 1999, p. 12)



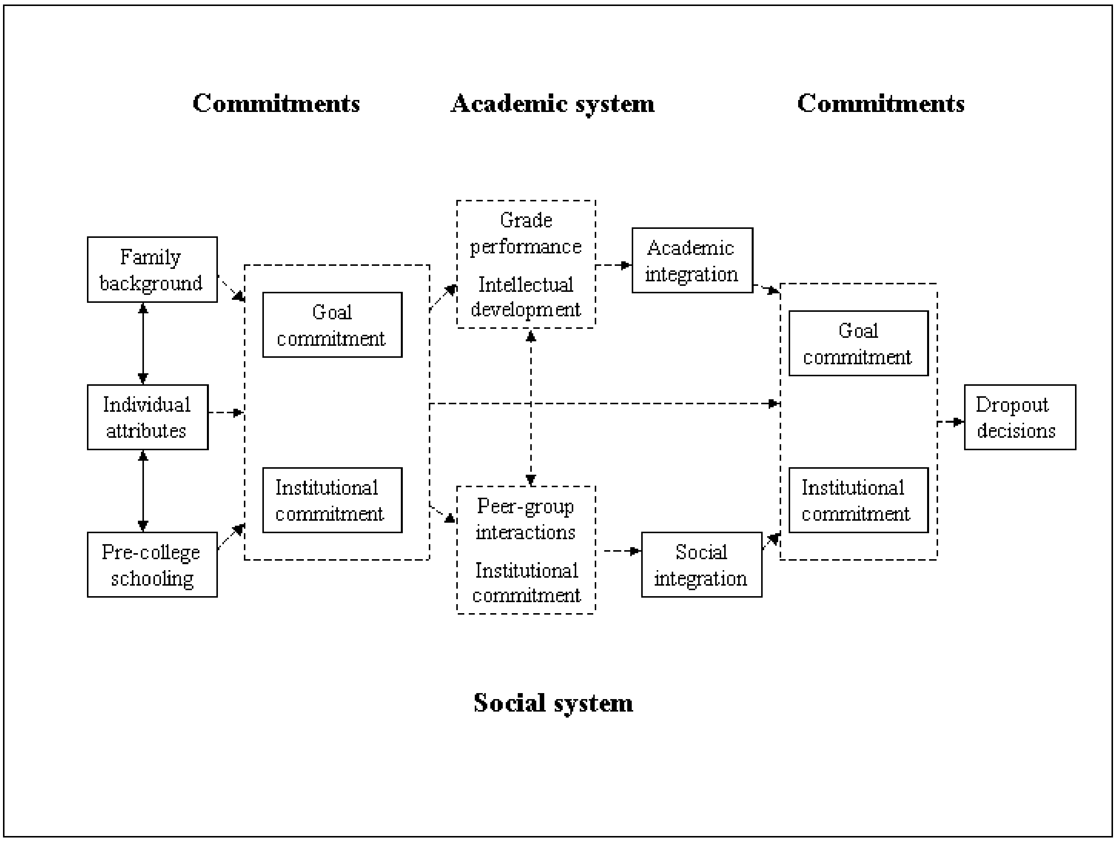
Prosser and Trigwell (1999) discussed the importance, for teachers, of taking account of the diversity of students' prior experiences and stated: "students' prior experiences of learning and teaching are fundamentally important to what they focus on in their studies" (Prosser and Trigwell, 1999, p. 26).

Many HE institutions have retention strategies in place that are likely to be aimed at bridging the gap between what students are able to do based on the skills they come in with, and what students must do and the skills they need in order to be successful (Staddon, 2002). Retention strategies have varying levels of success, which may largely depend on how well those strategies meet the needs of a particular cohort of students. The rapidly changing student profile makes it essential that retention strategies not only evolve to keep pace with student requirements, but also become pro-active in anticipating the requirements of incoming students. Staddon (2002) suggested that in order to retain wide access students, institutions might have to offer less traditionally academic programmes of study and teach in a different way, though this in itself will present challenges.

> Are enough academics ready and willing to revolutionise their approach, and should they? How can we give struggling students the huge amounts of help they need with their learning programmes when we have less time available? Is it fair to subject students to the difficulties of learning basic skills alongside the critical and analytical skills associated with higher education? (Staddon, 2002, p. 28).

In investigating reasons for non-completion, Yorke (2000) noted that engineering and technology students cited an above average number of influences relating to the student's ability to cope with the demands of the programme. The report suggested that this may, in part, be due to the calibre of entrants, but may also imply the use of a teaching approach that does not match the students' starting knowledge level or preferred way of learning. Seymour and Hewitt (1997) showed by qualitative analysis how teaching approaches typically used in science, mathematics and engineering were able to undermine students' confidence and progress, to the extent that some students left their programme of study. Yorke (2000) pointed out that future successful institutions would need to collect evidence of its provision from both persisting and withdrawing students and make use of this evidence to contribute to the quality of the education it provides. This needs to encompass both academic and social aspects of student life as these were both shown by Tinto (1975) to have considerable importance. Tinto's (1975) model of student attrition suggested that reasons for student drop-out were based upon the level of both academic and social integration experienced by the student (see Figure 3).

<u>Figure 3. Tinto's (1975) model of student attrition: "A conceptual schema for dropout from college" (Tinto, 1975, p. 95).</u>



Brunsden *et al*. (2000) examined Tinto's (1975) model of attrition and found that concepts such as "integration" were applied to students without any consultation as to how the student viewed them, and went on to note that "to be meaningfully understood, however, these commonalities should stem from the students' own perspectives rather than any imposed view" (Brunsden *et al*., 2000, p. 307). Tinto

(1975, p. 98) himself noted "it is the perceptions of the individual that are important", though individual student perceptions were not addressed further. A theoretical framework that stems from these individual understandings is likely to offer a better understanding of the student experience according to McKeown *et al*. (1993). Brunsden *et al*. (2000) concluded that Tinto's (1975) model of attrition may not be the most appropriate for current attrition research, it must be remembered that the modern student profile is very different to that in 1975, and the nature of HE study has undergone significant changes with a high proportion of students now living off campus and working part-time. The level of social integration expected by students in 2004 is likely to be minimal, or at least very different, compared to that of students in the early 1970's for whom university study was a life experience. For this reason, theoretical explanations of attrition in widening participation need to be driven from the students' perspective. Brunsden *et al*. (2000, p. 308) noted:

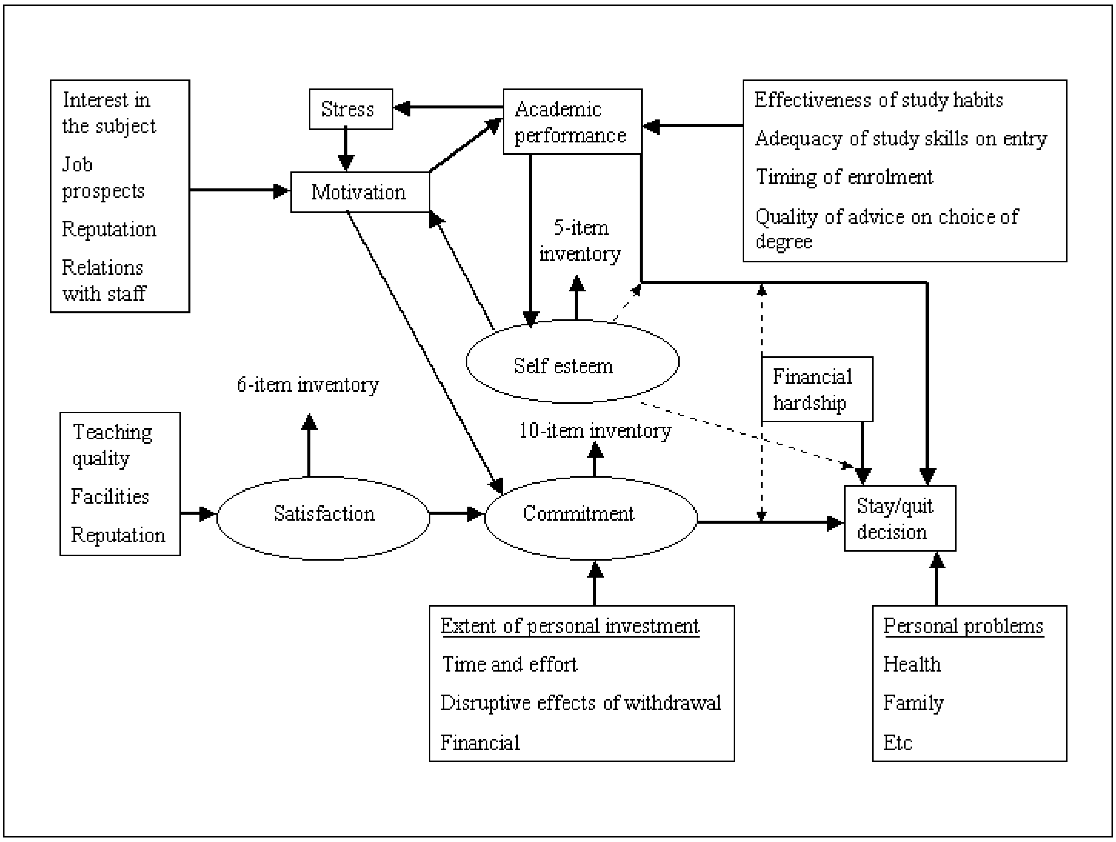
> Regardless of the style and method of approach, the crucial point is that any theory of drop-out should emerge from, and take account of, students' experiences and the context in which they make their decisions.

Draper (2003) pointed out that Tinto's model gained support because the central notion of "integration" appealed to people's common sense and doubts whether there was any empirical support or challenges to it. The author also questioned the methodology employed in studies of this nature by pointing out that 100% samples were needed especially of drop-outs otherwise self-selection creates distortion, though this would be virtually impossible to achieve, especially when attempting to obtain data from drop-outs. Draper (2003) was of the opinion that the school-university transition was a sub-part of the Tinto issue, and suggested that school computing does not prepare students for university computing and that it may be better to select students who would turn out to enjoy, and cope with, university computing, and stated:

> The real importance for HE of prior qualifications may be, I hypothesise, giving learners an accurate feel for what a subject is like in content, what it is like in required study activities, and whether they would enjoy studying it. Studies and theories of HE drop-outs usually show that "match" of student and subject is an important predictor of persistence vs. drop-out (Draper, 2003, p. 15)

Draper (2003, p. 12) pointed out that "the metaphor of integration is about fit; it is not about one party adapting to the other, but whether they go together well", and went on to explain that integration is the current outcome of a series of sequential changes which progressively modify that relationship. This suggests that integration may be as relevant today as in Tinto's 1975 model, but with less emphasis on the "social" and "academic", and more emphasis on how well they (the students and the courses they are on) go together. Yorke (1999) noted: "the (poor) quality of the student experience in engineering and technology was particularly likely to have been an influence on withdrawal". Bennett (2003) developed and refined a model of student withdrawal in a 'new' university business studies department and placed commitment at the heart of the model (see Figure 4). This model separates out the student factors that Biggs (1999) placed under the presage component of the 3 P model. Bennett's (2003) model grouped together student factors such as interest in the subject, job prospects, reputation and relations with staff and indicates that these have an effect upon student motivation. Another group of student factors were effectiveness of study habits, adequacy of study skills, timing of enrolment and quality of advice on choice of degree. This group of student factors were shown to have an effect on academic performance. This part of the model was cyclical in nature as academic performance had an effect on stress, which in turn affected student motivation, which then had an effect on academic performance.

Figure 4. A model of student retention (the revised model) Bennett (2003, p. 135)



Benett (2003) has expanded the range of student factors that impact on their learning approaches, and their outcomes, compared to Biggs' (1999) 3 P model. With increasing diversity and mass higher education, this is likely to be the right approach. Commitment by students to the course and institution was seen as a positive enhancement to that relationship, resulting from the investment made and the satisfaction gained. This model also showed that stress was strongly associated with academic performance, and that stress correlated negatively and significantly with motivation, while higher levels of motivation were reported by students who had good interpersonal relations with staff. The strongest influence on the decision to persist or drop-out in this study was financial in nature, though late enrolment was linked to several negative aspects of a student's university experience including poor performance. Bennett (2003, pp.134 - 135) noted:

> As hypothesised, low self-esteem significantly moderated the effects of financial hardship and poor academic performance on withdrawal: students with little self-confidence in their ability were more likely to quit when faced with poor grades or financial difficulties

Bennett's (2003) model set out to explain the reasons behind students' decisions to withdraw from their courses, whereas Boyle *et al*. (2002) attempted to identify factors that make a student successful (rather than reasons for attrition) by investigating entry, progression and graduation in Computer Science at two UK universities. There was found to be no discernable difference between the performances of traditional and non-traditional students at either Level 1 or Level 3. There was no evidence of any influence of A level mathematics as a qualification and concluded that entry qualifications are not limiting. "We hypothesise that 'success' is much more to do with intangible influences such as attitude and pre-university experience of the educational régime that universities deploy" (Boyle *et al.,* 2002, p.16). The author also noted that these things are hard to measure on application forms, but they are presage factors in Biggs' (1999) 3 P model. The models all have insights and relevance to the quality of the student experience and learning in HE, but the work in this study will focus on Biggs' (1999) 3 P model, as it is neither subject-specific, nor based on particular students or institution types.

In a qualitative study, Mackie (2001) investigated the experiences of both students who persisted and students who dropped-out of their business studies course in one UK HE institution. The difference between the two student groups was found to be mainly the level of commitment made by the individual student. Mackie (2001, p. 275) concluded:

> All students arrive with some level of commitment and an intention to complete their course of study, it is the concern that by the beginning of the second term we succeed, for some, in turning this 'expectant hope' into 'fears realised' and may have failed to exploit the potential within that initial commitment.

The students' level of commitment was found by Mackie (2001), to have been enhanced by positive feedback on both social and academic integration, and that commitment decreased with negative feedback. Homesickness was also seen as a feature of commitment as it was thought to reflect an inability to commit to the new environment. Commitment has been seen to be a major factor in student retention and has been linked to integration in several studies (Mackie, 2001; Taylor and Bedford, 2004 and Yorke, 2000), but integration, in terms of ensuring that students and their courses 'go together well' depends on several factors. Firstly, ensuring that students have a good understanding of what studying their chosen course in HE actually entails. Several studies (see Christie *et al.*, 2004; Taylor and Bedford, 2004 and Yorke, 2000) found that some students withdrew or had problems as a result of choosing the wrong course of study. It could be suggested that the student perceptions and expectations of a particular course had not been matched.

A second factor in integration is the change from teaching and learning methods in school or FE to those in HE, and a solution is to ensure that this is not overwhelming or daunting. Lowe and Cooke (2003) in a survey of first year science undergraduates found that there were differences in the nature of teaching styles encountered at university and those anticipated prior to arrival at university.

> Indeed, the greater rigidity and formality of teaching in schools appear to have led to an expectation among students prior to arrival that university teaching would be the same, with only 43% of students expecting a relaxed and informal teaching style at university (Lowe and Cooke, 2003, p. 74).

Almost half of the non-continuing students in a study by Christie *et al*. (2004) found it difficult to adapt to the working environment in HE. Similarly, Cook and Leckey (1999) noted that many students arrive at university with unrealistic views about the amount of work expected and the size of classes in which they will be taught and stated:

> Further, the teaching and assessment styles in school may lend themselves to the development of a set of study skills which persist into university but are no longer appropriate to the more independent styles of learning expected in HE (Cook and Leckey, 1999, p.169).

The differences between the expectations of the academic culture that students have prior to HE entry and that they encounter on commencing HE study are clearly significant. MacDonald and Stratta (2001, p. 257) concluded "it is clear that the strategy of inclusion and access cannot be operated effectively without an address to the wider concerns of academic culture and expectations".

A third factor in integration is the provision of early and frequent positive feedback on both social and academic aspects of undergraduate life. Mackie (2001) noted that organisational issues [course, academic, accommodation and timetabling] impact on social integration as large and changing lecture groups results in superficial rather than supportive friendships, which then impacts on commitment.

> A lack of organised social integration opportunities push the students back into their initial 'enclave', their accommodation, or even further back, into the security of the parental home and eventual departure (Mackie, 2001, p. 274).

Induction week is an appropriate time to provide social integration opportunities for new students. Edward and Middleton (1998) reported on a task-orientated induction programme for first year engineering undergraduates. Students, in groups, were given a challenge to complete in the first week using staff facilitators and a wide range of resources.

> …the induction programme sought to introduce students to their peers as well as academic staff and to afford students the opportunity to familiarise themselves with a range of systems. The skills development aspect of the programme was of prime importance however, and the activities were planned accordingly (Edward and Middleton, 1998, p. 46)

The study concluded that the vast majority of students found the experience beneficial and comments from participants reinforced the 'bonding' aspects of the exercise. Constant revision of the programme is in place in light of participant's comments. This type of induction would allow some positive academic feedback at a very early stage whereas most feedback is from the social environment during the early weeks until assessment marks are received later in the year. Similarly, Mackie (2001) noted the importance of positive, social and academic feedback on the student's commitment to stay. Yorke and Thomas (2003) pointed out that induction into the expectations of higher education is an important matter, especially to students whose backgrounds may not have given them an appreciation of what was expected of them. One institution introduced the students into the academic discourse of HE.

> This not only helped to prepare students for the academic experience, but it helped to develop the ‘academic match’, and to build expectations about what studying for a qualification in HE would be like (Yorke and Thomas, 2003, p. 69).

Expectations, motivation, academic performance and stress were seen to be linked by Bennett (2003), who went on to note that the growing problem of student stress should be recognised by including instruction in the techniques of stress management in study skills and induction courses. The author went on to state:

> Induction programmes should emphasise that low grades can be regarded as valuable indicators of the areas upon which a student needs to focus his or her attention, rather than indictments of an individual’s personal worth (Bennett, 2003, p. 138).

Since commitment and integration are seen as major factors in student retention, then induction week can, and indeed, should have a pivotal role in this. Both Bennett (2003) and Prescott and Simpson (2004) found that late enrolling students were at higher risk of dropping out than others it may be that they had less confidence than their peers in negotiating the learning environment, and consequently were at higher risk of not attending classes.

2.5 Approaches to learning

Considerable interest has arisen in the nature of student learning, especially with regard to improving the learning and teaching environment for students in HE. “There is evidence from a variety of studies that one important reason for inadequate progress during the first year [in HE] is a failure to adopt appropriate study skills" (Tait and Entwistle, 1996, pp. 97-98). A number of studies on student approaches to learning (Marton and Saljo, 1976; Biggs, 1978 and Entwistle and Ramsden, 1983) reported the differences between deep approaches and surface approaches to learning (Trigwell *et al.,* 1998). Entwistle (1998, p. 3) noted:

> Subsequent research has shown that a deep, strategic approach to studying is related to high levels of attainment in HE, while a surface, apathetic approach is more likely to lead to failure.

Deep and surface approaches describe the way students relate to a teaching and learning environment; they are not characteristics of a student (Biggs, 1999). The student's approach to learning depends on how they handle the information, and their personal learning intentions (Laurillard, 2002). Similarly, Rhem (1995) also pointed out that the student's approach, whether deep or surface, does not represent their character or personality, but it represents a relationship between the student and what he or she is trying to understand. The student's approach is not entirely determined by the context though as Biggs, (1999, p. 17) stated:

> Students do have predilections or preferences for this or that approach, but those predilections may or may not be realised in practice, depending on the teaching context.

In one qualitative study, McCune and Entwistle (2000) found that students were consistent in their approaches to everyday studying to some extent, and that approaches to studying were influenced both by the individual and the context. The student's approach is an interaction of the presage factors in Biggs' (1999) 3 P model.

These factors being a student's prior knowledge, level of interest and understanding of the topic and motivation, with the student's perceptions of the requirements of the task and the teaching context (Prosser and Trigwell, 1999). A student who intends to complete a task using the minimum effort demonstrates a surface approach whereas a student who intends to develop an understanding of the subject and to relate ideas demonstrates a deep approach to learning (Biggs, 1999). The literature does not always clearly define the terms 'approach', 'style' and 'strategy', though a strategy is, according to Laurillard (1979, p. 396), "exhibited by what the student does in order to learn something", or how the student works through a particular task. 'Learning styles' are, according to Busato *et al.* (1998), considered as a kind of general strategies, types of learning, orientations to learning or as approaches to learning.

Knowledge of how an individual student approaches studying at a specific time in a particular subject can be of significant interest to teaching staff in HE, but Laurillard (1979) pointed out that different kinds of approach may be used by the same student on different occasions, depending upon the conditions of the task, and stated:

> In addition, a pilot study on a group of seven students showed that they reported different approaches to different types of learning task: the same student might adopt quite different approaches depending on his perception of the conditions in which he was doing the task. It was dangerous, therefore, to make the assumption that any individual student had a well-defined, characteristic learning style that could be determined by a one-off experiment (Laurillard, 1979, p. 397).

Deep and surface learning approaches illustrate a primary difference in how students learn, having been identified, and shown stability in studies across the world (Ramsden, 2003). In questioning the effect that different approaches to learning have on the quality of student learning, and how the outcomes of learning are associated with the approaches they use, Ramsden (2003, p. 53) stated:

> What students learn is closely associated with how they go about learning it. …. It is also evident that approaches are related to how much satisfaction students experience from their learning. Deep approaches are related to higher-quality outcomes and better grades. They are also more enjoyable. Surface approaches are dissatisfying; and they are associated with poorer outcomes.

Since there are different approaches to learning, there must be reasons for students adopting those approaches. Ramsden (2003, p. 51), whilst concurring with Laurillard (1979) that the same student will use different approaches on different occasions, also pointed out:

> It is also true that general tendencies to adopt particular approaches, related to the demands of the course and previous educational experiences, do exist.

This would indicate that the teaching and assessment régime encountered by those students in their previous school or FE course is likely to influence the nature of student learning in the first year of HE. Ramsden (2003, p. 66) noted: "the approaches to studying students deploy at university are certainly influenced by their experiences of learning at secondary school". Since less than half (45%) of our 2003 intake had traditional A levels and 35% had the Advanced Vocational Certificate of Education (AVCE) then it is important to note the OFSTED report (2004) on vocational A levels, which found the assessment régime to be excessively complex and bureaucratic. The report stated:

> For their part, students spend too much time completing assessments rather than learning. As a result, it is often difficult to cover the whole content of the course, and the learning lacks depth, in that an understanding of key overarching concepts is not developed (OFSTED, HMI 2146, 2004, p. 5).

There is evidence in the literature to support the link between heavy perceived workload and over- assessment with increased tendencies towards surface approaches to learning. Kember *et al.* (1996, pp. 352-353) noted: "The positive link between surface approach and perceived workload shows that it is those adopting a surface approach who feel that their workload is high". Probably the tedium of trying to memorise material without trying to understand it or be interested in it makes students perceive their workload as heavy. "The negative path between deep motive and perceived workload shows that those with intrinsic interest in the course do not worry about how hard they work" Kember *et al.* (1996, p. 353). In a study that examined the classification of learning styles and how they relate to curriculum values, Smith (2002, p. 68) stated:

> The most effective learning is typified by a 'deep' approach, in which the student seeks to understand and internalise knowledge and ideas. Other students adopt a 'surface' approach that focuses on a minimal grasp of ideas, limited reflection and a reliance on rote learning. Clearly 'deep' learning is the kind of learning we would expect students to gain from a university education.

Smith (2002) also pointed out that our education system often promotes a 'surface' approach.

> Some of the course characteristics associated with a 'surface' approach, such as lack of opportunity to pursue subjects in depth, relatively high course contact hours, an excessive amount of course material, and a threatening and anxiety-provoking assessment system

> are the indirect consequences of changes intended to widen access and choice (Smith, 2002, p. 68).

According to Prosser and Trigwell (1999), Biggs (1999) and Ramsden (2003) students' approaches to learning are associated with their conceptions of learning and their conceptions of what they are learning. Those who perceive the workload to be high and that a quantitative increase in knowledge is required are likely to conceive learning to be about memorising and increasing stored knowledge and will, as a result, adopt a surface approach to their learning. Students who conceive learning as abstracting meaning and interpreting reality are more likely to take a deep approach to leaning. "Conceptions of learning and the subject being learned are part of a student's prior experiences" (Prosser and Trigwell, 1999, p. 16). This demonstrates that students bring with them certain conceptions of learning based upon their prior experiences, which interact with the teaching context they experience in HE to determine the way they approach their learning. Biggs' (1999) 3 P model of teaching and learning shows how this interaction affects the outcomes achieved by the student which highlights the need to have an understanding of the conceptions of learning that diverse students bring to tertiary education, and how these conceptions may interact with the teaching context they encounter in HE. "Their conceptions of learning, defined by the assessment tasks and learning outcomes, is the driving force behind their learning" (Allan, 1995, p. 3). Entwistle (1991) described how departments that students rated as having a heavy workload and those that have an assessment régime that requires the accurate reproduction of detailed information are both likely to foster a surface approach to learning in their students. Entwistle (1991) also noted: "There is accumulating evidence that over-loaded syllabuses, particularly in the applied sciences, lead to student coping mechanisms that inhibit high quality learning" and concluded by stating: "it is possible to alter courses, including teaching and assessment procedures, in ways which more directly support a deep approach to learning" (Entwistle, 1991, p. 5). Rhem (1995, p. 4) citing Ramsden (undated), emphasised the delicate balance required:

> It isn't so much the specific teaching and assessment methods you use that make the difference to the quality of student learning, but the reasons why you use them and the way the students perceive them. The key thing to understand about approaches is that they arise from the student's perception of the teacher's requirement.

Ramsden (2003) discussed attempts that have been made to instruct first year students in the use of a deep approach, but the main effect was that students increased their use of surface approaches. Subsequent interviews with students showed that they perceived the first year of their course to require accurate retention of large amounts of content. Marton and Saljo (1984) attempted to manipulate students' approaches to reading but found that students interpreted what was demanded of them in different ways, and some may have brought with them a predisposition to use a surface approach.

> The fact that some students begin higher education with habitual tendencies to use a surface approach has implications for how effectively they will be able to engage with the learning tasks they are set. This in turn implies that we must make special efforts to design learning contexts for first year students which rapidly develop more sophisticated approaches to academic learning (Ramsden, 2003, p. 66).

The importance of students' prior experience in influencing their conceptions of learning and their approach to learning are stressed by Prosser and Trigwell (1999).

The authors noted the importance for teachers in HE to help students to become aware of the effects of this prior experience and to help them to develop a more appropriate approach. On the basis of limited research evidence, Richardson (1994) hypothesised that mature students were more likely to adopt a deep approach to studying than younger students, who were, conversely, more likely to adopt a surface approach. It was suggested by Richardson (1994) that the system of teaching and examinations in the final years of secondary education caused students to adopt a surface approach to learning. This author also found that mature students were more likely to be intrinsically motivated and that the prior life experience of a mature student promoted a deep approach towards their studies in HE. This factor was similarly described by Biggs (1985) who commented that a deep approach seemed to be facilitated by "the planning and decision making that is part and parcel of adult living" (Biggs, 1985, p. 191). In a similar vein, Harper and Kember (1986, p. 220) stated: "older students, rather than their younger counterparts, display those *learning* characteristics which traditionally higher education has purported to be striving to develop in students". Richardson (1994) noted a scarcity of studies on mature students but also reported that studies were generally concerned with academic performance rather than educational experience and contested the widely held idea that: "mature students lack the basic skills needed for effective study in higher education" (Richardson, 1994, p. 309). A second study by Richardson (1995), which used the ASI (see Chapter 3, Section 3.1) found that older students scored higher on the deep approach scale and lower on the surface approach scale than younger students, but that there was no association between the scores on the deep and surface approach scales and points scored by students at A level.

Students are now entering HE with a wider range of entrance qualifications, and experience of varied learning environments and assessment régimes than at any time. Krank (2001) noted how numerous studies have reported evidence of a relationship between learning styles and academic success, but that the typical academic environment is not supportive of diverse learning styles and stated:

> Any educational system that fails to account for the needs of divergent learning styles through varied learning environments or varied teaching methodologies, at a minimum, risks squandering valuable human resources (Krank, 2001, p. 58).

Hayes *et al*. (1997) concluded that an inclusive model of higher education that adapts to the changing needs of society and the changing demands of prospective students will be more likely to accommodate different attitudes, approaches and orientations to studying than one that seeks to perpetuate itself and to reinforce and maintain traditional values within society.

2.6 Teaching and learning

The larger and more diverse student body that is now seen in HE will have had a wide range of teaching experiences prior to entering HE. The student presage factors in Biggs' (1999) 3 P model of prior knowledge, ability and motivation will have been affected by the nature of the students' prior experiences of teaching. Students are likely to have experienced relatively small class sizes in FE or sixth form, with considerable amounts of contact time and teacher support. The teaching context they experience on commencing their HE studies is generally found to have larger class sizes, larger and less frequent assessments, low levels of class contact time and tutor support and different teaching methods. Since Biggs' (1999) 3 P model shows that the teaching context interacts with the student factors and affects the way that students approach their learning it is fundamentally important that these two sets of presage factors take account of each other. This is reflected by Prosser and Trigwell (1999, p. 6) who noted:

> We know that the prior experiences that are evoked are particularly important to the quality of learning in the new situation, and we know that the established context, and the way it is perceived, is similarly important. So what does this say to us about the way we might practice teaching and help students learn?

There is an abundance of literature on the subject of teaching and learning in higher education (see for example Ramsden, 2003; Biggs, 1999 and Laurillard, 2002) and two significant themes to emerge are that student learning cannot be separated from the context in which it takes place, and from the student's perception of the requirements of the task. McInnis (2001) noted that changes to teaching, learning and assessment in HE had not kept pace with the rapid changes to access and participation, and that whilst providing access to HE was important, it was equally important to ensure that students were able to progress and achieve their aims. "The students learning to program have changed. It is time for the teaching to change to meet their changing needs. If it does not, the time is not far away when it will be too late" (Jenkins and Davy, 2003 p. 85). This is the conclusion reached by the authors of a paper, which examined the implications of teaching programming to an increasingly diverse student body. Nicol (1998) discussed the application of learning research in HE and noted that group-learning methods are on the increase as are teaching strategies geared towards sharing the responsibility for learning with the students. This involves students sharing their knowledge and expertise with peers where tutors act as facilitators. This, however, is somewhat restricted by the fact that learning in HE is largely driven by assessment grades, and is complicated by different course requirements, outcomes and learning environments, hence classes are mainly organised around individual and competitive learning rather than shared goals and learning partnerships (Nicol, 1998).

> Applying the research on learning to improve higher education teaching is not an easy task. The research is vast, exceedingly complex and no single research perspective is appropriate for all teaching and learning situations (Nicol, 1998, p. 95).

Ramsden (2003) made the point that a myth related to the culture of university teaching is that, because a large part of the learning takes place outside of lectures, tutorials and workshops, then the teaching itself is not very important. The learning becomes the student's job, quite separate from the teaching. An extension of this argument is that independent learning is imposed rather than encouraged. Students with an academic background may be relatively comfortable with this style of teaching, but students with a vocational background may feel unable to cope. Without some form of direction in their student-directed study, some students are likely to fail to develop as independent learners. As the student body becomes ever more diverse, then teaching must change in order to cater for the requirements of today's students. Ramsden (2003, p. 110) stated: "teaching is comprehended as a process of working cooperatively with learners to help them change their understanding. It is making student learning possible". Prosser and Trigwell (1999) on the relevance of their research noted: "the results suggest that there is something the university teachers can do about learning – not by trying to change the student, but by trying to change the context experienced by the student" (Prosser and Trigwell, 1999, p. 7). These authors continued by making the point that students enter HE courses with a wide variety of experiences and backgrounds, not only in levels of prior understanding, but also in how they conceived learning, how they have previously approached their learning and their thoughts and experiences of the subject or topic. These factors all affect the way in which different students will experience a learning situation as their perceptions of that context will vary because of those prior experiences of teaching and learning. Prosser and Trigwell, (1999, p. 59) stated:

> University teachers need to take a student perspective on teaching, and to think about the variation in students' experience and how it may affect the way students perceive and experience what they are designing and structuring. University teachers need to try and look at their designs through their students' eyes.

Biggs (1999) made the point that teachers have to work with the students that they have, and that lectures and tutorials, that worked well previously, with highly selected students, may not work as well with today's diverse students. Biggs (1999) described teaching as operating at three theoretical levels, where level 1 teaching encompasses the theory of instructivism. This theory is that teaching is about transmitting information to students in a one-way flow of information and that differences in learning are due to differences in students, their backgrounds, ability and motivation. In this type of teaching, no account is taken of the student or their perceptions of the teaching context. In level 2 teaching, the focus is on the teacher transmitting concepts and understandings. This relies on the teacher's armoury of teaching techniques, but does not necessarily engage the students in appropriate learning activities. Level 3 teaching, however, focuses on what the student does. It is a student-centred theory of teaching where teaching is seen as supporting learning. "Getting students to understand at the level required is a matter of getting them to undertake the appropriate learning activities" (Biggs, 1999, p. 24).

There has been a rapid increase in student numbers without commensurate increase in resources (Gibbs and Lucas, 1995) and the consequences of this are larger class sizes and the difficulties associated with successful teaching of large classes. The high staff: student ratio that has resulted from increasing student numbers means that there is less time to support student learning overall and particularly of programming, reported Jeffries and Barrett (2002). The authors found there were too many students for effective one-to-one teaching and supervision in programming practicals. Gibbs and Lucas (1995) noted that in many courses, a response to larger class sizes involved replacing coursework assessment with more economical exams and multiple choice question tests. From American evidence of class size and student performance, Gibbs and Lucas (1995, p. 2) stated:

> It seems likely that the negative effects of class size on student performance become apparent when a deep approach is required, through demands for higher level learning outcomes or through interaction, but possibly not when only a surface approach is required.

Mass lectures and inexperienced or part-time staff are often used on large, level one core modules, according to Lovell (2002), but this does not give students a good foundation for their learning in subsequent years. Lovell (2002) used previous research on learning theory to develop an approach designed to encourage student-centred learning in light of the problems created by increased student numbers and decreases in funding. When planning to make changes to a module the author stated: “as it was a core module, it was important to give the students a good learning experience, one that captured their enthusiasm and provided a strong intellectual foundation for their later work” (Lovell, 2002, p. 2). Students in this study had complained that too much ground was covered too quickly and that assessment was concentrated at the end of the semester. The new régime included small group work within large group sessions; a reduction of content to allow some in-depth work; assessment split into three tasks with deadlines throughout the semester and the use of a student learning journal. A US study of different teaching techniques used in HE showed that lectures continue to be the primary method of instruction, that males lecture more than females and that time spent lecturing is positively related to class size (Lammers and Murphy, 2002). The authors also reflected on other research that compared the effectiveness of lecturing and other teaching techniques, and found that the results depended upon the learning objective and stated:

> Lecture was generally equal or superior to other techniques when the objective was learning facts and general information. Other techniques were often superior when objectives centered on problem solving-skills and interest in the discipline (Lammers and Murphy, 2002, p. 64).

This report concluded that some combination of teaching techniques is probably best but noted: “an instructor’s profile of teaching techniques is not as indicative of student learning as the quality and context with which the techniques are used” (Lammers and Murphy, 2002, p. 64). It is a question of using teaching methods that enable students to engage with the material to be learned, though large lecture theatres are seen as limiting by many staff. Biggs (1999, p. 80) stated: “There is no doubt, however, that class size has a crucial influence on teaching style". Biggs (1999) went on to note that lecturing is endemic in large classes mainly because many see it as the only way to teach. Laurillard (2002) pointed out that lectures were defensible in old systems where student selection meant that classes were filled with students who had similar capabilities and experience but noted: "Open access and modular courses make it most unlikely that a class of students will be sufficiently similar in background capabilities to make lectures workable as a principal teaching method" (Laurillard, 2002, p. 92). Large class sizes do not lend themselves easily to most forms of interactive teaching mainly because of the fixed rows of seating in lecture theatres and the presence of a sole lecturer to organise groups or other activities, but interactive teaching may be a crucial factor in teaching students from FE or vocational backgrounds. A UK study on factors that help or hinder progression from FE to HE reported:

> In HE, the environment of learning (vast lecture hall with large numbers of learners) and the large amount of independent study required were disliked. Many did not appreciate the style of teaching and learning with its low levels of interaction and felt they lacked the skills and understanding to cope with the requirements of written assessments (Comfort *et al*., 2002, p. 8).

This study indicated that students from FE or vocational backgrounds have had a very different type of teaching and learning experience prior to entering HE, which may not be taken account of. Biggs (1999) suggested several ways of promoting active learning in large classes including incorporating short breaks for students to reflect, consolidate notes and ask questions. Other activities can be usefully included, such as learning partnerships where students work in pairs, student led groups and peer teaching. These activities need considerably more planning and management by lecturers, but will undoubtedly enhance the student learning experience. Garland (1998) reported that peer assessment can contribute to improving students as learners in small groups but also stated that: [it was] "unusual for all members to fully cooperate in group work" (Garland, 1998, p. 284). Group work, though, could reduce the feeling of anonymity experienced by students in the large classes found in HE (Biggs 1999). On peer teaching, Biggs (1999, p. 110) stated: "the research on peer teaching finds that both the tutor and the tutee benefit academically, the tutor more than the tutee". The author stressed the importance of using the teaching method that is most likely to enable students to realise the learning objectives as "when there is alignment between what we want, how we teach and how we assess, teaching is likely to be much more effective than when there is not" (Biggs, 1999, p. 26). Biggs (1999) explained that this alignment, which he refers to as constructive alignment, requires a union between the constructivist understanding of the nature of learning, and a design for teaching that is aligned to it. Constructivism is a theory of teaching in which knowledge cannot be instructed by a teacher, it can only be constructed by the learner. Students have to organise and develop the things they hear and read. "Constructivism suggests that the learner is more actively involved in a joint enterprise with the teacher of creating new meanings" (Atherton, 2003, p. 1). Biggs (1999) maintained that the consistency created by aligning the teaching and learning activities and assessment methods with the curriculum objectives enhances the likelihood of students engaging in appropriate learning activities. "Constructive alignment makes the students themselves do the real work; the teacher simply arranges things so that it is more likely that they will" (Biggs, 1999, p. 27). Reimann (2004) argued, though, that constructive alignment does not sufficiently take into account the diversity of modern students and that students should be incorporated into the model as an integral component. Given the different levels of subject knowledge and experience of first year HE students it is unlikely that the same learning outcomes can be achieved by both traditional and non-traditional students on the same module as Reimann (2004, p. 13) noted: “certain individual differences do in fact have an impact on student learning in economics and that Biggs’ (1999) model of constructive alignment might not adequately capture them”. From this, Reimann (2004) implied that diverse students have a greater range within the presage factors of Biggs’ (1999) 3 P model. This may be a greater number of student factors, or a greater range for each particular factor, it is unclear which. If the same outcomes (or product) cannot be achieved by both traditional and non-traditional students, then it is likely that there is a difference in the learning-related activities of the student at the process level of the model. Reimann (2004) also noted that resource constraints restrict the use of tailor-made units for separate groups of students and institutions see the ‘one size fits all’ modules as being more economically viable. Race (1993, p. 21) stated: “if the learning is alright, the teaching will look after itself”. This indicated that if the teaching had enabled students to engage appropriately with the material to be learned, then the teaching method was also appropriate. The author took learning back to a fundamental level by showing that anything is learned by doing, practicing and learning from mistakes, rather than listening to experts or reading about it. The author described how wanting to do something (motivation) coupled with doing it (practice), followed by feedback and time to make sense of it (digestion or reflection) are key to successful learning.

> My main point is that ‘wanting’, ‘doing’, ‘feedback’ and ‘digesting’ are so close to the essence of ‘being human’ that it is possible to keep

> these processes firmly in mind when designing educational courses, training programmes and learning resources (Race, 1993, p. 16).

Race (1993), in line with Biggs, 1999; Laurillard, 2002 and Lammers and Murphy 2002, noted that lectures are used where large numbers make it difficult to do things in a different way. Lectures are, traditionally, a way of getting through a lot of material with high numbers of students. "The fact that it is usually the lecturer (and not the students) who is getting through a lot of material is often ignored" (Race, 1993, p. 110). It is clear that lectures are the most cost effective way that institutions can offer tertiary education to large numbers of students. "Despite all the concerns that are expressed about the method, lecturing is likely to remain part of the higher education scene for the foreseeable future" (Brown and Race, 2002, p. 40). The traditional lecture, however, where students copy or take notes, as part of a one-way transmission process is unlikely to promote the type of learning and engagement other activities can provide.

Meeting the diverse needs of students will accelerate changes already underway to enhance teaching and learning in universities, according to McInnis (2001) but there are obstacles, particularly the reluctance to bring about changes to curriculum design and delivery in case standards should become diluted. It may be that this reluctance is partly responsible for the slow rate of changes to teaching, learning, assessment and support in comparison with the rate of changes in access and participation. "The relationship between diversity and issues of teaching, curriculum design and delivery is complex and inevitably raises questions about the extent to which academics are disposed and able to defend their values" (McInnis, 2001, p. 113).

2.7 Assessment and feedback

Assessment is rather more than merely a means of grading students' work. Whilst the outcome of assessment, whether qualitative or quantitative, resides at the product level of Biggs' (1999) 3 P model, the learning-related activities undertaken by the student with respect to that assessment, are at the process level of that model. James *et al.* (2002, p. 7) stated: "Carefully designed assessment contributes directly to the way students approach their study and therefore contributes indirectly, but powerfully, to the quality of their learning". Assessment tasks that are perceived by the student to require the regurgitation of quantities of material delivered in class will inevitably drive a student towards memorization and rote learning. Assessment tasks that the student perceives to require a deep understanding promote more effective engagement with the material by the student (Ramsden, 2003; Biggs, 1999 and MacLellan, 2004). Boud (1995) found that a student's response to assessment was not solely a response to the assessment tasks set, but of all the experiences of assessment that student has had previously. James *et al.* (2002) pointed out that while assessment is a central component of teaching and learning, its primary purpose is to gauge the extent of student learning. Assessment also provides the means to monitor and improve teaching and therefore has a pivotal role in the teaching and learning process. Ramsden (2003) explained how assessment has several functions, which include reporting on students' achievements, measuring student learning and diagnosing misunderstandings so that students can be helped to learn more effectively. To achieve this it is important to provide feedback that is helpful, critical and encouraging. A report by the Learning and Skills Research Centre (LSRC) (Anon, 2004) found evidence that feedback and support were important and noted: "several sources commented on the negative effects of poor feedback" (Anon, 2004, p. 30).

Assessment régimes have evolved considerably from times when the traditional end of course exam involved students recalling as much information as possible, in a given time and probably under considerable stress. Teaching staff now have an array of assessment methods to choose from, but Biggs (1999) made the point that the method or type of assessment is, in itself, less important than that the assessment realises the teacher's objectives, whilst taking into account practicality and validity. There is an ongoing debate, according to Laurillard (2002), about whether we should be assessing what students know, or what they can do. "The traditional modes of assessment of knowledge are seen as inadequate because they fail to assess students' capability in the authentic activities of their discipline" (Laurillard, 2002, p. 204). Laurillard (2002) continued by pointing out that a solution would be to find more challenging ways of assessment.

The increase in student numbers in HE has had a greater effect on assessment than in teaching itself in most academic subjects. Race (1993, p. 43) stated: "it is almost as easy to lecture to 300 as to lecture to 100". The author indicated that maintaining the quality of assessment in light of increased student numbers is in itself challenging – not to mention improving it. "When it comes to assessment, there are no short cuts. It usually takes three times the amount of time to assess 300 learners as it would to assess 100 learners" (Race, 1993, p. 43). The greatest increase in time is inevitably in marking essays or exam scripts. Methods of assessment other than essays and written exams have been developed to enable large numbers of students to be assessed with a minimum increase in staff marking time. One method of assessment used in large, first year modules is the multiple-choice questionnaire (MCQ). These have the advantage that they are objective, hence removing subjective marking bias; they can be marked without extensive subject knowledge; they are quick to complete and mark and can be used to test a wide range of the syllabus (Higgins and Tatham, 2003). There are some issues regarding MCQs in that it is thought that students may be able to guess the correct answer and various methods such as the use of negative marking, raising the pass mark or mathematically normalising the marks achieved have all been used with varying results (Higgins and Tatham, 2003). If students are able to guess the correct answer then the assessment does not provide accurate feedback to staff on the level of student learning. Struyven *et al*. (2005) found that MCQs tended to push students towards a surface approach to studying, though Higgins and Tatham (2003) reported that it is possible to set questions that allow students with greater application and analytical skills to shine. This would, however, depend on the ability and availability of staff to develop such questions. Using statistical modelling of MCQ tests Burton and Miller (1999) determined that use of negative marking to deter guessing was preferable to setting high pass marks to provide reliability, noting that an over-cautiousness model would be better, compared to a guessing model. "Notwithstanding this discussion of over-cautiousness, one can argue that if one has insufficient confidence in knowledge to use it, then one does not effectively possess it" (Burton and Miller, 1999, p. 409). In a study of first year computing undergraduates Kuechler and Simkin (2003) noted that both students and instructors expressed preferences for multiple-choice tests over constructed-response tests, but stated: "Most instructors believe that constructed-response tests examine a higher level of cognitive reasoning than do multiple choice tests" (Kuechler and Simkin, 2003, p. 396). The authors compared the results of MCQ and short answer tests given to 152 computer programming students in an attempt to investigate how closely multiple choice questions and constructed response questions were related as evaluators of the students and concluded that all the variables (e.g. gender) together explained less than half of the total variation in performance in the multiple choice section of the tests. "This finding echoes earlier studies suggesting that MC formats enable test takers to better guess correct answers compared to constructed response tests" (Kuechler and Simkin, 2003, p. 394). Epstein *et al*. (2002) noted that a drawback to both essay and MCQ test formats was the failure to facilitate learning during the test process and the return of tests without information to correct inaccurate responses and stated:

> The typical multiple-choice test may be an effective and practical assessment tool but it does not convert mistakes into new learning. Indeed, without corrective feedback, the learner likely exits an examination assuming that an incorrect response was actually correct; thus, an examination that does not employ feedback may promote misconceptions (Epstein *et al*., 2002, p. 188).

This study by Epstein *et al*. (2002) demonstrated that students tested using an Immediate Feedback Assessment Technique (IF AT) demonstrated higher scores and correctly answered more questions than they had initially, than did students evaluated with standard optical marking sheets. The authors advocate that this type of assessment is more likely to directly involve the participant in active information processing and does not foster the acquisition of incorrect information and noted: "it is generally agreed that the best tests are those that teach while assessing" (Epstein *et al*., 2002, p. 200). Gibjels *et al*. (2005) noted that the assessment of students' achievements viewed as separate from instruction is no longer tenable and stated: "as assessment, learning and instruction become more and more integrated, there is strong support for representing assessment as a tool for learning" (Gibjels *et al*., 2005, p. 73). Since assessment tasks can generate deep or surface approaches to learning depending upon the students' perceptions of those tasks, assessment that promotes a deep approach in the students' learning related activities becomes a powerful tool for learning. The study by Gibjels *et al*. (2005) involved integrating assessment tasks in a problem-based learning environment with second year law students and noted: "both students and tutors were happy about the way assessment tasks were embedded in the curriculum. Students reported studying more, and more critically and more systematically as a result of the assessment tasks" (Gibjels *et al*., 2005, p. 84). Students who participated in this study performed better in their final exam than others, but no account was taken for student motivation or increased teacher time, however, the introduction of assessment tasks was seen to help students to address more appropriate student learning activities, going beyond the tasks and their content.

Traditional and open-ended exams and course work often require students to write essays. Race (1995) noted how essays allow students to express themselves freely and show depth of understanding. Most students are familiar with this type of assessment, but international students may be disadvantaged especially if English is not their first language. This type of assessment takes time to write and considerably more time to mark than most other forms of assessment. They may assess only a fraction of the syllabus and are prone to subjective marking even when clear assessment criteria are available. Essay writing is commonly intended for assessing higher cognitive levels, according to Biggs (1999, p. 169) who stated: "Theoretically students can express their own views and constructs, and support them with evidence and original arguments". Biggs (1999) did, however, point out that the time constraint imposed in exam conditions was more likely to promote memorising with or without higher-level processing, and to impede originality. Assessing divergent responses is difficult, especially with a checklist marking scheme, but plagiarism is minimised in exam situations. Ramsden (2003, p. 186) noted:

> Many conventional practical tests and traditional assessments that occur regularly throughout a course consume prodigious amounts of staff resources in marking and student time in preparation. Much wider use could be made, with educational as well as economic benefits, of methods which emphasise students' cooperative work, rather than competition against each other; of self-assessment, techniques; of short answer questions which are geared to measuring understanding (in preference to multiple choice tests).

The use of peer/self assessment, group work and portfolio assessment are ways of reducing staff marking time and promoting appropriate learning activities in students. Peer, self and group assessment have added value in that they are able to provide instant feedback to both students and teaching staff. Many modules, however, are not assessed until the end and this precludes the opportunity to modify or design the teaching in response to student understanding (Prosser and Trigwell, 1999). Gibbs, (cited in Brown and Glasner, 1999) highlighted several ways in which assessment can be changed to bring about changes in student performance. Weekly problem sheets, formerly marked by lecturers in an engineering module, were marked at peer-assessment sessions facilitated by post-graduate students. Whilst the marks did not count, students were required to complete 75% of the problem sheets in order to take the end exam. Average exam marks rose from 45% to 75%. It was thought that previously students had not spent time doing the problem sheets as there had been no social pressure to turn up prepared. The author pointed out that this encompassed two underlying principles and stated:

> The first is ‘time on task’. This principle is based on research about the time students spend studying and the effect this has on performance. Basically this principle is, ‘if you don’t spend time on it, you won’t learn it. The second principle here is that not only did the assessment generate enough learning activity, it generated appropriate learning activity. The best way to learn how to tackle problems is to tackle lots of problems Gibbs (cited in Brown and Glasner, 1999, pp. 44-45).

This is reflected in Biggs’ (1999) 3 P model, which shows that when learning-related activities generate appropriate, deep approaches to learning, it leads to higher quality learning outcomes. In a study to determine staff and student perceptions of assessment, MacLellan (2004) sought views on the extent to which assessment is concerned to enable learning rather than merely measure learning. It was found that staff thought they were assessing a full range of learning even though essays were the most frequent mode of assessment. Students with good essay-writing skills may be rewarded for producing work with a clear introduction, well constructed central section and a firm conclusion irrespective of other factors, whereas students with poor essay-writing skills may be disadvantaged regardless of the level of effort and learning-related activities they engaged in. A wide range of assessment tasks needs to be employed in order to assess the full range of learning and to prevent particular groups of students from being disadvantaged. Essays are time-consuming to write hence may cover only a small part of the syllabus. The dangers of subjective marking are greatest when marking essays unless very strict criteria are adhered to, but this can put those with flair and divergent responses at a disadvantage (Race, 1995). Students thought that a frequent purpose of assessment was to make a summative judgement of student performance, and did not exploit assessment to improve their learning. This indicated a mismatch in the perceptions and expectations of assessment by students and staff. There may be differences in the student presage factors in Biggs’ (1999) 3

P model, and those that staff think students have, given the increasing diversity of students. There may also be differences between students and staff in perceptions of the teaching context. These will both have effects upon the approaches to learning and the outcomes achieved by those students. "Given that assessment practices may or may not precipitate powerful or transformative learning it seems important to appreciate the central involvement of students themselves in the assessment process" (MacLellan, 2004, p. 97).

Formative assessment is critical to the learning process according to Yorke (2001) who stated:

> Positive feedback is not mere praise, but, in an educational setting, includes an acknowledgement of the student's strengths together with an indication of how he or she can develop further. No feedback at all, or belated feedback (as in the case of with summative end-of-unit assessments in modular or unitised schemes), cannot be expected to advance student learning (Yorke, 2001. p. 116).

According to Race (2001), feedback is vital in just about all learning contexts. Ramsden (2003, p. 187) stated: "it is impossible to overstate the role of effective comments on students' progress in any discussion of effective teaching and assessment". Young (2000, p. 409) noted:

> "Assessing student' work is a delicate balancing act. On the one hand, there is the need to grade students' work and provide feedback: on the other, a concern to protect psychologically vulnerable students and foster positive self-esteem".

The author also noted the importance of lecturers identifying students' needs at a very early point in the course. The same feedback given to two different students may have completely different effects. Some use feedback as an opportunity to learn from mistakes, while others may be devastated by any negative comment. This article recommended informal discussion in tutorials or when setting and returning assignments to help identify those students who were most vulnerable. Mutch (2003) noted that in terms of feedback, what is clear to staff may not be clear to students and suggests that departments should provide explicit guidelines on giving effective feedback. The author described feedback as a developmental activity and stated: "Above all, this relates to the capacity of students to make sense of, and apply feedback in order to further their learning" (Mutch, 2003, p. 37). Falchikov (2005) reported on the benefits of involving students in the assessment process, which included improved student learning and development, facilitating skills development and providing feedback. The author noted that peer assessment was introduced in many cases as a result of educational pressures and stated: "Such changes included increased demands on staff time and energy, a proliferation of learning objectives and widely differing abilities of students in relation to handling increased responsibilities" (Falchikov, 2005, p. 84). With large numbers of students indicating that they required more feedback, and having identified feedback as a key component of formative assessment, many staff have identified peer assessment as a means of addressing the problem (Falchikov, 2005). Ramsden (2003) noted how students generally found timely feedback more useful than delayed comments and stated:

> It is worth emphasising that it is not always necessary for academic staff to give feedback: students can often learn more from formal or informal assessment by their peers or by themselves. Giving comments on another student's work, or being required to determine or

> defend one's own, not only increases a student's sense of responsibility and control over the subject matter; it often reveals the extent of one's misunderstandings more vividly than any other method (Ramsden, 2003, p. 189).

While peer-assessment may lack some of the 'precision' of some formal methods of assessment, Race (1993, p. 49) stated: "what may be lacked in terms of precision is more than compensated for by the benefits of deeper learning, which go hand in hand with learners themselves assessing".

Increasing use is being made of portfolios as a method of assessment. As with other assessment methods, there are advantages and disadvantages to their use, but Irons and Alexander (2004, p. 107) noted: "portfolios help with student ownership and motivation, which have in turn been found to help reduce plagiarism". Portfolios can include pieces of work, evidence of skills development, feedback comments and reflective analyses by the students, which means that they can demonstrate development (Race, 1995). Biggs (1999) suggested using other assessment tasks apart from a portfolio to cover basic knowledge, and to state clear requirements for the portfolio especially on size limits but found that students were generally positive, on reflection, about portfolio assessment. Irons (2002) reported on research into the use of portfolios as a means of assessing learning outcomes in computing and found that they reduced the overall student workload whilst facilitating the breadth and depth of assessment. By having a portfolio entry for each learning outcome, the portfolio assessed each learning outcome once. Increased student motivation was attributed, in part, to students taking ownership of their work. Irons (2002, p. 68) stated:

> The experience of using portfolios to assess learning outcomes indicate that portfolios work as method in assessment and should be incorporated as an accepted method of assessment in mainstream computing.

In a review of assessment techniques, Race (1995) noted that no form of assessment is without merit or limitation but stated: "the challenges caused by greater numbers of students and increased assessment workloads provide an opportunity to make a radical review of the ways we assess our students" (Race 1995, p. 4).

2.8 Expectations and motivation

Widening participation has brought an increase in the ways in which, besides background, students are diverse. These, according to Jenkins and Davy (2003) include expectations and motivation. The authors noted that motivation could be seen as a function of two factors, expectancy (expectation to succeed) and value (the value of success), as: "motivation = expectancy x value. The two factors are said to multiply, rather than add, since if either falls to zero, there will be no motivation" (Jenkins and Davy, 2003 p. 3). The authors explained how students must, at least at the beginning of their course, attach some value to success, even if that simply means avoiding failure; they also must expect to succeed, at their own personal level, but that current teaching and assessment régimes are too inflexible and stated:

> Given this diversity (and it is an increasing diversity), is it really sensible to teach all the students in the same way? Or to reverse the question, is it sensible to expect them all to learn in the same way? (Jenkins and Davy, 2003, p. 2).

Fazey and Fazey (1998) also discussed the interaction between value and expectancy noting that a highly valued outcome and a high expectation of success are linked to achievement whereas low value and low expectation of success are likely to lead to withdrawal. "Students are most likely to apply effort when the goal is personally valued and they assess that it is achievable" (Fazey and Fazey, 1998, p. 65). Motivation is a student factor in the presage part of Biggs' (1999) 3 P model of teaching and learning, hence, a student's expectation to succeed and their value of success need to be taken into account, and these will affect the way the student approaches their learning. Rather than seeing motivation as a stable personality state, Entwistle (1998) noted that motivation was affected by teaching and assessment. "Whether or not staff believe it is their job to motivate students, research findings make it very clear that their ways of teaching and designing assessment will, nevertheless, have strong influences on student motivation" (Entwistle, 1998, p. 20). The difficulties faced by academic staff in providing a learning environment to meet a wide range of student needs, were reported by Winn (2002). These difficulties arose from the diversity of the students' experiences and the complexity of the relationship between students' lives and their academic work, but the author stated:

> The findings suggest that there is scope for tutors to explore ways of developing students' capacity for independent learning through use of teaching, learning and assessment strategies which are known to enhance student motivation (Winn, 2002, p. 455).

Students have a variety of motivations when approaching a computing degree, and the form of motivation does appear to be a factor in their level of success. Some are intrinsically motivated, having a genuine interest in the subject; some are extrinsically motivated and see their degree as a means to a well-paid job; others may be socially motivated, trying to please their families (Jenkins, 2003).

> It has been shown that perhaps, not surprisingly, students who struggle in programming are more likely to have a primarily extrinsic motivation than their colleagues who excel. Then again it has also been shown that students generally maintain some form of motivation throughout their programming course, even if it comes to hinge on a negative factor such as fear of failure (Jenkins, 2003, p. 54).

Jenkins (2001) however, defined two further types of motivation; achievement, where the primary motivator is to "do well" on a personal level, and a "null motivation" that encompasses students who just want to pass. Jenkins' (2001) study of computing undergraduates from two UK institutions found that there were two dominant reasons for students choosing their degree course. Almost 40% were motivated for some future gain or career, and over 36% were motivated by the desire to learn. The author pointed out that by understanding and addressing the motivation of a class of students, it may be possible to provide a better learning experience and stated: "The instructor must appreciate the factors that are affecting the motivation of a class, and must become a skilled motivator as well as a skilled teacher" (Jenkins, 2001, p. 54). In this study, however, the students mostly had A level grades BBB or BBC in any subject so direct comparison with students from wide access institutions such as the University of Wolverhampton may not be possible. In a study of undergraduate psychology students, Jacobs and Newstead (2000) found that students seemed to be motivated in different ways, possibly forming two distinct groups. Some students were motivated by subject related activities, while others were motivated by generic activities e.g. the general skills and experiences obtained whilst at university. Jacobs and Newstead (2000, p. 253) stated:

> ..they [teachers in HE] need to be aware that students are motivated in different ways and that for some the principal motivation may lie outside the discipline they are studying. It would be unwise to

> discourage such students: they may in fact be the most employable, since employers increasingly stress the importance of generic, transferable skills.

Round (2005) found that students entering computer science courses in HE often have limited or unrealistic expectations of the subject content, as the course does not usually follow directly on from their A level or FE course and mismatches are inevitable. If a student's expectations are not met, the result is a motivational 'black hole' (Round, 2005). One Australian study (McKenzie, 1993) found that students tend to focus on entry requirements and career-related issues rather than the reality of three years of full-time study, and what this actually entailed. "The fact that so many students found their course was not as they expected it to be can be a problem for both the students and the institutions" (McKenzie, 1993, p. 334). McGettrick *et al*. (2004) reported that no universally accepted university entrance qualification in computing exists, and few institutions require a prior qualification in computing and stated:

> On being asked what they are expecting to study, entrants to university computing programmes usually are unaware of what they are going to study in a way that entrants to other disciplines are not. This can lead to disappointment and dissatisfaction. Surveys of dropouts reveal this as a major cause of attrition (McGettrick *et al*., 2004, p. 18).

Boyle *et al*. (2002, p. 7) noted: "dropouts seem to be connected with lack of preparedness [by their previous course of study], lack of preparation [for university life], lack of motivation and poor expectations". The authors found that entry qualifications are not limiting in computer science and that expectation is key to student response to university life. Since expectation has been shown to be closely linked to motivation, a student factor in the presage factors of Biggs' (1999) 3 P model, expectation will undoubtedly affect the learning-related activities and the outcomes achieved by the student.

> "We hypothesise that 'success' is more to do with intangible influences such as attitude and pre-university experience of the educational régime that universities deploy – of course these are particularly hard to measure in application forms" (Boyle *et al*., 2002, p. 16).

A study of first year student opinion by Cook and Leckey (1999) found that students had unrealistic expectations of the class sizes they would find in HE, not expecting the large classes they met. They also found that students had underestimated the workload expected of them in some modules and noted:

> Students entered the university with many good intentions borne out of their previous experience. It is clear that they felt that they had not adhered to those good intentions when faced with the actual experience of working in a university. This is particularly true of those aspects of their work in relation to time management (Cook and Leckey, 1999, p. 166)

Thompson (1998) reported that students found it difficult to cope with a lack of individual attention largely due to the expectations they had brought with them from school or college where small groups were the norm and tutors had more time. "They simply had not been prepared for the very different situation that they found at university" (Thompson, 1998, p. 131). This, again, relates to the presage factors in Biggs' (1999) 3 P model, that students bring with them to HE study from their previous educational experience. Student motivation was seen by MacDonald (2002) to be affected by an end of module examination as students reported the need to put in more effort and to study more seriously than they might otherwise have done. The author stated:

> Although students had described difficulties with the examination in one year on this particular course, it was clear that the revision period was in general greatly valued as a time for reaching an understanding of the course, and for covering material which had not been previously assessed. Furthermore, its importance in reaching a synoptic understanding was certainly linked, and probably driven by the motivational effect of the examination itself (MacDonald, 2002, p. 333).

Drew (2001) in a study of student perceptions of HE found that students were motivated by courses that had relevance to the real world and work and that concepts were best understood when placed in context. The author also reported some positive and negative effects of assessment on motivation and noted: "If course content and activities seemed irrelevant to assessed work, morale was affected and confusion created" (Drew, 2001, p. 319). Leach *et al*. (1998) evaluated the effects of involving learners in the assessment of their learning in order to maximise learner motivation. They found that their views were not always in line with the perceptions of students. "On the evidence presented here we are unable to claim that motivation through assessment serves the needs of extrinsic learners. In the data we have it is difficult to distinguish extrinsic from intrinsic motivation" (Leach *et al*., 1998, p. 208). The authors noted, however, that students became more comfortable and began to realise the benefits of participating in the assessment process after the first year of the course. The majority of the literature on motivation and expectations related to issues for widening participation and non-traditional students. It also important not to forget the motivational needs of the more able or better prepared students, who may find level one work too easy and become demotivated as a result. Thompson (1998, p. 131) stated:

> It seems that these students' needs are not being fully met in our efforts to bring everyone up to the same level during the first year of

> the course, and this could mean that we risk losing some of our more able students because of this.

Biggs (1999) referred to the expectancy-value theory of motivation and noted that teachers should worry less about motivating students and more about teaching better.

> When they teach in such a way that students build up a good knowledge base, achieve success in problems that are significant and build up a feeling of 'ownership' over their learning, motivation follows good learning as night follows day. It is a matter of getting the causes and effects right (Biggs, 1999, p. 61).

From Biggs' (1999) standpoint, good teaching will enhance or even create motivation in students. While Gregory and Jenkins (2004) noted the importance of lecturers taking account of diverse student motivation in order to run successful courses, the authors also stressed the difficulty of the concept since the motivation of a student is an intangible and very personal thing. Gregory and Jenkins (2004) found that assessment strategies can be made more varied and interesting which in turn helps to motivate students. This can be by giving students the option of producing a report, a poster, a web page or giving a presentation.

> While care has to be taken to ensure that different options can be marked against the same learning outcomes, giving students some sort of control can encourage them to become more involved with their work. This is particularly important for first year students (Gregory and Jenkins, 2004, p. 26)

Both Biggs (1999) and Gregory and Jenkins (2004) agreed that giving students ownership or control of their own learning, both motivation and learning were enhanced. Whilst the notion of good teaching that enhances motivation must, surely be the target of most teaching staff, the idea of assessment options for students is likely to cause some consternation, if only on the grounds of difficulties in marking. The initial difficulties may well be outweighed by the benefits to students and addressing the wide range of needs and attributes of today's students. Meeting the expectations and motivating the very diverse students that enter HE computing courses is likely to be more challenging now for staff than at any previous time, but since motivation is an important part of success, it is necessary for staff development to take account of developments in teaching and learning and innovative assessment strategies.

2.9 Student support

In recent years, with changes to funding, the introduction of student loans and the removal of maintenance grants, much emphasis has been placed on financial support for students in HE. Other aspects include support through the application process and programme planning, academic support, personal and emotional support and miscellaneous items such as accommodation. The Higher Education Quality Council (HEQC) produced a set of guidelines for an integrated system of advice, support and feedback in 1995, designed to provide a framework for institutions to base their guidance and learner support provision upon (Wisker and Brown, 1996). The expansion of the HE sector in the 1990's, with widening participation bringing in students from very diverse backgrounds has, however, put pressure on support services. Emphasis was placed on widening access and possibly not enough on how non-traditional students would cope once they were in HE. Gould and Harvey (1999, p. 6) stated: "it is doubly important that students from disadvantaged backgrounds are given additional support to stay in the system". The authors noted that non-traditional students withdrew from their courses for a variety of reasons such as personal and/or domestic, or a lack of support or encouragement besides academic failure. Students from non-traditional backgrounds have greater support and teaching needs, especially in the first year (Allen, 2001). The author continued by pointing out that this begins with induction and / or freshers' week, which is generally geared to students who are living away from home and becoming independent for the first time. Many non-traditional students would benefit from more practical help, such as reading lists and timetables, in order to juggle work and family commitments around studying. It could be argued that a failing here is a lack of time and resources to promote the type of staff development that would lead to a more practical and better integrated induction and freshers' week that would cater for the diverse student body.

Student factors in the presage part of Biggs' (1999) 3 P model are likely to be more extensive for today's non-traditional students than for earlier cohorts. According to Bamber and Tett, (2001) the type of support necessary for non-traditional students to be successful is likely to be more teacher-intensive than that required by those from traditional backgrounds. This does, however, have implications for UK institutions where participation has increased and student: staff ratios are higher now.

> For institutions this means providing sustained support to students throughout the course in relation to the external and internal factors that affect the learning process. For its part the university must accept that the implications of offering access to non-traditional students does not end, but rather begins, at the point of entry (Bamber and Tett, 2001, p. 74).

One of the recommendations made in a study by Connor *et al*. (2001) is a need to improve the personal support from tutors, and to ensure from the outset that students understood the level of support they could expect. It was noted, though, by Rivis (1996, p. 4) that:

> There is a widespread view that the expansion of student numbers has meant that personal tutor systems have been put under enormous strain and in many institutions have in fact collapsed.

In a study on student withdrawal in one UK HE institution, students reported: "the personal tutor system operated unevenly, with some staff making themselves more available than others to see students" (May and Bousted, 2003, p. 21). Connor *et al.* (2001) also found that pre-entry information could be improved to good effect and stated:

> Students who were the least satisfied about their higher education experience were the most likely to have felt ill informed about higher education on entry, especially on teaching, personal support from tutors and overall learning experience (Connor *et al.*, 2001, p. 5).

Earwaker (1992) describes how the 'tutor' role has developed from medieval times when undergraduates were allocated to a 'tutor' who would take care of their personal and academic development, acting *in loco parentis*. This régime would have been almost entirely enabled by the low numbers of tertiary level students prior to the late twentieth century. The author pointed out that many members of staff now have the title 'tutor' and that in one study: "there were a number of staff who were actually trying to serve as 'the first person the student turns to' for more than 100 students" (Earwaker, 1992, p. 46). Another factor in the evolving role of the personal tutor is that prior to 1972, most undergraduates were not considered to be adult as the age of consent was twenty-one. Since the age of consent changed to eighteen, most entrants to HE are adult, and as such are expected to be self-reliant and responsible for their own development. Whether or not the change in the age of consent has resulted in more adult behaviour in undergraduates may well be a matter of some debate, but it has reduced the burden of responsibility on the personal tutor. Yorke (1999) noted that advising students on their progress and their possible futures has always been a feature of the UK HE system but there was anecdotal evidence that numbers of students seeking advice had risen in recent times, and stated:

> Some students leave their institutions because they feel they lack support: pressures of numbers are militating against the personal tutor system that used to be a standard feature of the higher education experience. Others are taking over part of the personal tutor's role – for example, those concerned with academic guidance through modular schemes. Others, such as counsellors, are in a position to play a crucial supporting role (Yorke 1999, p. 105).

While institutions generally now have comprehensive counselling and guidance services that offer a wide range of support, it is almost inevitable that students who need help are likely to turn to a familiar face in the first instance. Personal tutors and lecturers were those that students were most likely to seek advice from, prior to withdrawal according to Yorke (1999). This author noted: "the abiding importance of the staff-student relationship at a time when, because of the pressure of numbers, the pastoral aspect of the academic's role has been under threat" (Yorke, 1999, p. 52). It is likely though that academic staff's perceptions of their roles in supporting students would to a large extent be based upon current staff development and their previous experiences as undergraduates. Moxley, *et al.* (2001) advocated a student-centered approach to retention that is primarily for the benefit of the students rather than the institution. The institution can personalise the process by: "taking seriously the issues students face and helping them to form relationships with caring members of staff who can assist them to identify, frame and subsequently resolve these issues" (Moxley *et al*., 2001, p. 54). While there are difficulties implementing a personal tutor system in many institutions, the authors point out that members of staff who have roles expanded beyond teaching have a pivotal role in retention and noted:

> Students can get close to these members of staff and learn directly from them about their love for a subject matter, their commitment to an academic discipline and their understanding of a profession (Moxley *et al*., 2001, p. 55)

Though it may be highly desirable to have an effective personal tutor system in operation, there are likely to be difficulties for staff in determining the boundaries of the role. Earwaker (1992, p. 71) noted: "Unlike professional support staff, teaching staff may not have a very clear idea of how they are expected to contribute to the support process". Where institutions employ professionally trained counsellors and advisors it is important that teaching staff are aware of this and are able to act appropriately. Earwaker (1992) found that staff wanted more 'back up' and stated:

> Several staff suggested the production of some written guidelines for all staff on how to operate in a student support role, together with basic information about the institution's support services (Earwaker, 1992, p. 50)

This author went on to point out that a tutor should be seen as instrumental in facilitating the helping process by providing objectivity, rather than as the helping agent. Yorke and Thomas (2003, p. 70) also noted how the role of the personal tutor has changed and state: “If students’ patterns of engagement are now different, then the personal tutor could be one of the stable points of contact between student and institution”. The personal tutoring system can effectively deliver support providing it is well resourced in terms of staff time. Staff development, both internally and in the wider HE environment, is essential to the success of any changes made in light of the increasing diversity of modern students. This is reflected by Peelo (2002) who stated:

> An effective service provides learning support staff with opportunities for reflection, supervision, further training, attendance at conferences and interaction with a wider world of practice and research (Peelo, 2002, p. 169)

South Bank University has produced a Core Skills Policy document launched in June 2000 (Anon, 2000) aimed at catering for the needs of non-traditional students many of whom are drawn from the local community as a result of the university’s widening access policy. Students are diagnostically assessed on entry and an action plan identifies support at course level and from central services. This type of built-in, structured support from the point of entry appeared to be a positive and logical step forward in the academic support of students. This policy is underpinned by staff development activities, an area which is integral to the success of any changes, but seldom is at the top of any agenda. Early identification of students who are at risk is a key factor in retention (Earwaker, 1992; Wisker and Brown, 1996 and Moxley *et al*., 2001), enabling appropriate support and/or counselling to begin sooner rather than later. Allen (2001, p. 16) stated: “There is a need to spread good, widening participation practice across HE”. Integration of these initiatives into an institution’s overall strategy would surely provide a more holistic approach to the support and retention of students.

2.10 Conclusions

An abundance of literature on widening participation and retention in HE is indicative of the level of concern in this area. For new universities especially, the traditional student with A levels, a middle-class background, supportive parents and no ties is in the minority as new students are welcomed in with very diverse backgrounds, entrance qualifications, expectations and support requirements. This will, however, affect the presage factors of Biggs' (1999) 3 P model of teaching and learning to an extent that is, as yet, unclear. Whilst widening access to groups who previously would not have had the opportunity to study in HE is inevitably going to result in higher drop-out rates, it is clear that there are ways to enhance retention. Incoming students need to be better prepared and be better informed of the nature and realities of studying in HE, and HE institutions themselves need to go some way to welcoming and integrating these students and adapting to their needs.

Many non-traditional students have developed approaches to learning in school and FE that are not appropriate for HE study. The literature indicates that these students have frequently been in régimes with high levels of class contact time and very structured syllabi. HE institutions need to take account of this and develop the first year programmes in such a way that students move from structured studying to student directed study in smaller steps rather than the giant leap so frequently described.

Changes to teaching and learning are essential to promote more student involvement and engagement with their work. With a wealth of excellent and committed teaching staff, this should be relatively straight forward, but the literature highlights challenges such as increased numbers of students without commensurate increase in resources and larger class sizes that have increased the staff: student ratio, neither of which enhance the abilities of staff to become innovative. The diversity of students also means that they have different starting points and skills, which will affect the way they approach their learning, and add to the difficulties for staff to provide a smooth transition into learning in HE.

Assessment and feedback are seen to be pivotal to learning. The literature indicates that much can be done to make assessment part of the learning process rather than a separate item at the end of a module. Deep approaches to learning are generated by assessment tasks that are perceived by students to require a high level of engagement with the subject, while surface approaches are generated when students' perceptions are that memorization is all that is required of them. Larger class sizes have inevitably resulted in higher marking loads for teaching staff, but the literature highlights peer marking, group working and self-assessment as areas where marking by staff can be reduced whilst involving students in marking the assessment can positively enhance their own learning, and provide timely feedback. The literature has shown that diversity within the student body needs to be reflected by diversity in assessment, otherwise particular groups of students may be disadvantaged.

The increased diversity of students' backgrounds and prior experiences is seen in the literature to be matched by increasingly diverse expectations and levels of motivation. There is no doubt that in order to succeed in HE, students need to have a certain level of motivation, which in turn is linked to their expectations being met, and by their giving value to success. The literature, however, highlights that a number of computing students enter HE with limited knowledge of the content of the programme of study they are embarking on, which undoubtedly means that they are likely to have vague or few expectations that are, inevitably, unlikely to be met. There is a body of evidence to show that motivation can be enhanced by teaching, learning and assessment methods that involve the students and ensure that they engage with the material in different ways. HE institutions and their staff need to ensure that incoming students have realistic expectations of the subject content and of the whole university experience, and then to provide a stimulating and rewarding learning experience that takes account of diversity. Failure to do this will inevitably lead to more students developing motivational 'black holes', resulting in high levels of failure and drop-out.

Student support has evolved from the traditional personal tutor to the all-encompassing student services of the modern HE institution. The literature, however, reveals that non-traditional students have a need for more one-to-one tutoring as they tend to lack confidence in the early days and have limited experience of student directed learning. Students also need support in a wider variety of ways than previously as financial issues, family or partner support and educational background have become increasingly significant as factors that affect progression and achievement. There is a need for students to have a friendly face as a first port of call when problems arise, but the high staff: student ratio now common in HE makes this particularly challenging to re-establish.

3. The Research Design

3.1 An overview of the research approach.

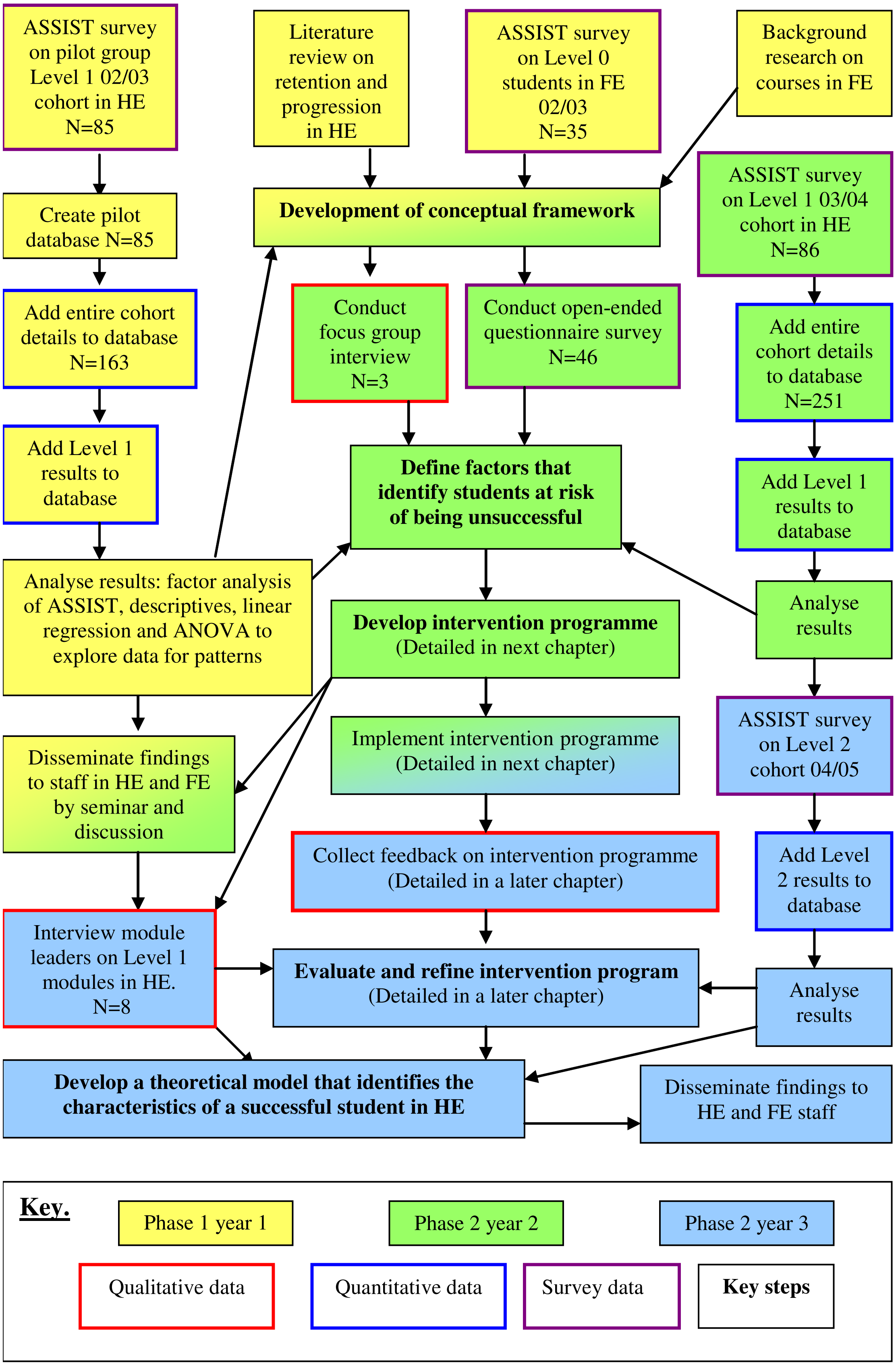
Rather than seeing objective and subjective research as being in opposition to each other, there is a view that researchers may take a position on a continuous scale between objectivity (positivism) at the one end and subjectivism (interpretivism) at the other end (O'Brien, 1998 and Miles and Huberman, 1994). Cohen *et al*. (2000) also describe a spectrum with positivism and interpretivism existing at opposite ends of that spectrum. Positivist researchers hold the view that there is one reality in a world of natural phenomena, which is quantifiable, real and external to the individual. Positivist research is often concerned with the gathering of facts and quantitative analysis of large sets of data (Blaxter *et al.,* 2001). Conversely, interpretivist researchers believe that there are multiple realities; each existing in the mind of the individual and this research is much more subjective. Interpretivist research tends to involve smaller numbers and explore areas in greater depth and detail (Blaxter *et al.,* 2001).

The social world cannot be fully explored by either qualitative or quantitative data alone since this suggests that there is only one way to see the world (Miles and Huberman, 1994). Positivism sees social facts as 'things' and seeks to establish causal relationships whereas interpretivism takes account of description, meaning and subjective experience.

One of the aims of the research underpinning this thesis was to improve the achievements of non-traditional students on computing courses at one 'new' university. This required the collection of objective or quantitative data on students' entrance, transition and progression in HE; subjective or qualitative data on their perceptions of those factors and some qualitative data that were described and analysed using quantitative methodology. For this reason, this thesis was not located in one particular research paradigm. This research drew upon both the positivist and the interpretivist research paradigms, according to their appropriateness to address each issue, hence the research was eclectic.

The research fell into two distinct phases where the first phase was primarily to generate a profile of the students, their characteristics and their achievements at Level 1, while the second phase endeavoured to use this information to develop an intervention programme. Phase one was undertaken using a modified grounded theory approach, which is discussed in detail later (see Chapter 3, Section 2). Phase two was research that attempted to improve action, and for this reason was undertaken as action research (see Chapter 3, Section 3) where theory is created in order to advance practice rather than as an end in itself (Bassey, 1990). The steps taken and the approaches used in each phase of this research are depicted in the flow chart (Figure 5) that follows where qualitative data were obtained by interviews and open-ended questionnaires. Quantitative data were obtained from Registry and survey data were obtained by use of the ASSIST questionnaire which used quantitative methodology to explore qualitative data.

Figure 5. Flow chart for the research design



3.2 Phase one.

The objective of the first phase of the research was to generate theory from data; hence a modified grounded theory approach was used to construct a picture that captured students' characteristics and progression through Level 1 in HE. Grounded theory, first developed by sociologists, is a method of analysing qualitative data, which reflects the concept that the theory that emerges from the work is grounded in the data gathered from the target group. Grounded theory, described by Glaser and Strauss (1967) involves a process whereby data from one interview is analysed before conducting the next interview so that information can be introduced into subsequent interviews, which is 'grounded' in the data from previous interviews. This study made no attempt to conduct interviews in this manner, but attempted to draw on the principles of a grounded theory approach as described by Dick (2005, p. 2) who stated: "Grounded theory begins with a research situation. Within that situation your task as a researcher is to understand what is happening there and how the players manage their roles". This study also deviates from grounded theory in that quantitative data were also included in the analysis. Generally, grounded theory analyses qualitative data, but the inclusion of quantitative data was justified by the need to develop a clear overview of student progression in Level 1 in HE.

The initial steps in this project were to build a picture of the students' backgrounds in school or FE and of the nature of the courses they studied there. This was, essentially, exploratory research as it enabled the researcher to gain information on a subject about which little was known and provided a platform on which further research could be based. The students' entrance qualifications and conceptions of learning were added to the picture, as were their learning styles, teaching preferences and preferred teaching styles. The picture was enhanced at the end of Level 1 by the addition of module results and qualitative data on their experiences.

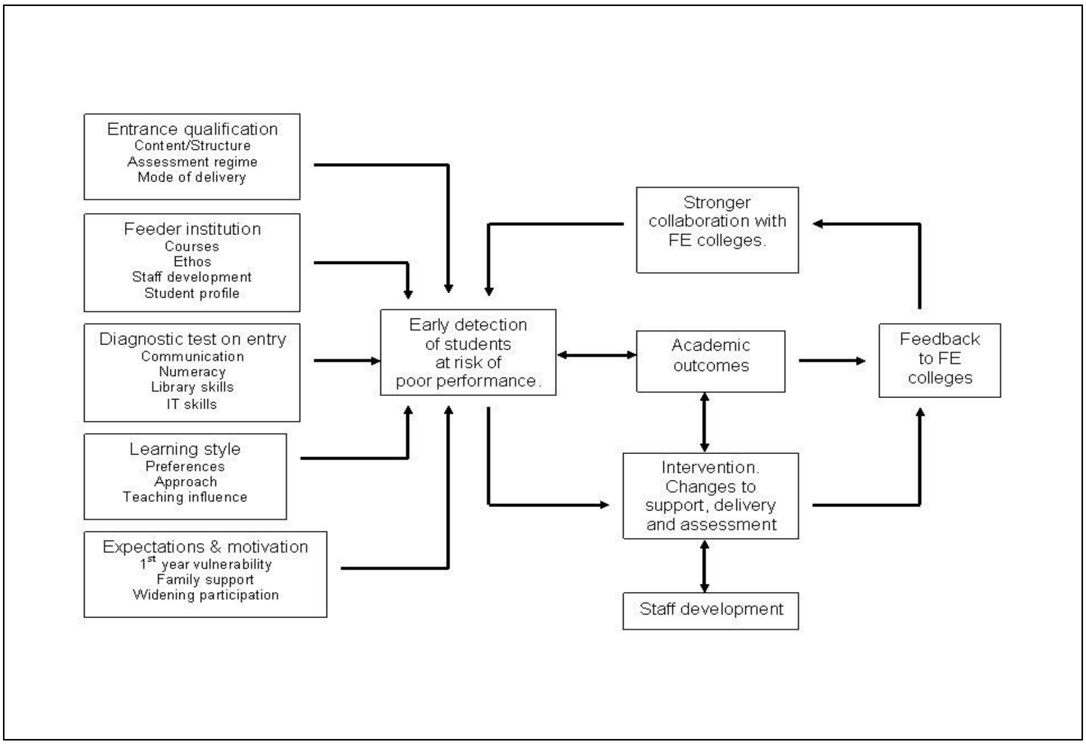
Student drop-out and poor progression have been shown to be multifactorial issues (Bamber and Tett, 2000; Connor *et al*. 2001 and Mackie, 2001). This research did not attempt to investigate every factor since this would have been beyond the scope of this project, but certain factors were thought, from prior experience and evaluation within SCIT, to be significant for our students. Statistical examination of a first year database of all students entering SCIT at Level 1 in 1997, 1998 and 1999 had been undertaken. The results showed that on computing awards, generally students with any pass at all at A-level grades A-C had an increased chance of being successful and those with GNVQ/BTEC, at any grade other than distinction, had a poorer chance of success. These results were in line with results obtained nationally where a GNVQ background has been correlated with enhanced risk of non-completion of the first year at university (Abramson and Jones, 2001). Examination of the SCIT database revealed that the identity of the local institution students came from also impacted on their chances of successfully completing the first year. From this information, and factors suggested by recent literature on computer science education to be significant (see Irons and Alexander, 2004; Jenkins and Davy, 2003 and Falchikov, 2005), five factors were selected to be investigated for their influence on student progression and achievement in HE Computing and Computer Science courses at the University of Wolverhampton:

- the students' entrance qualification;
- the feeder institution attended by the students prior to HE entry;

- the students conceptions of learning and preferences for different types of course and teaching;
- the students' approaches to learning;
- the students' expectations and motivation.

A conceptual framework was developed (see Figure 6.) in order to provide structure and meaning to the research, and to map the presumed relationships between the factors in the cyclical part of the research. According to Miles and Huberman (1994) developing a conceptual framework forces the researcher to be selective in deciding which variables are most important and which relationships are most likely to be meaningful. This then helps the researcher to decide what information should be collected and analysed and formulate the research questions. "It is a direct step from conceptual framework to research questions" (Miles and Huberman, 1994, p. 23).

Figure 6. The conceptual framework developed for this research project.



3.2.1 Entrance qualification

The students' entrance qualifications were investigated for their course content, assessment régimes and mode of delivery. It was considered important to gain an understanding of the nature of these qualifications as, from 1997 to 2001, less than half of the student intake at the University of Wolverhampton had traditional A levels. There is evidence to suggest that progression or completion rates may vary according to the entrance qualification or previous course studied by the student. For example, in one "new university" Abramson and Jones (2001) found that the institutional average non-completion rate in 1998 was 25% while the non-completion rate for Advanced GNVQ students was considerably higher at 36%. Abramson and Jones (2001) also sought to compare their institutional non-completion rates of Advanced GNVQ students to the national average rate, but this was not possible owing to the Higher Education Statistics Agency (HESA) being unable to provide non-completion data by main entrance qualification. Since widening participation inevitably involves a wider range of entrance qualifications, it would enhance research in this area if data were more specific on the particular qualification that secured the place for a student on a course in HE. The role of a student's previous educational experience on their progress in HE was reported by Johnes (1990) who found that academic difficulties in HE may not be due to a lack of student ability, but from the student's educational background. Johnes (1990) also pointed out that students from grammar or independent schools were more likely to persist in HE than others and that the type of school attended provides a crude indication of a student's social background. It was for these reasons that it was considered important do develop a greater awareness of the nature of the diversity within a modern student cohort and to develop an understanding of the educational régimes encountered by students prior to HE entry.

This study aimed to increase the levels of awareness and collaboration between Level 1 staff in HE and colleagues in FE. SCIT had forged links with local FE colleges and regular meetings of the FE / HE liaison committee have been held. This liaison committee involved staff from SCIT and staff in FE who taught and supported students on computing courses at their institutions. These meetings provided an excellent occasion to enlist the help and cooperation of staff in FE in the project, and gave rise to regular opportunities to provide feedback on the project findings. Increases in the cohort sizes in HE, as a result of widening participation, have led to students being taught in larger groups and having less direct contact with staff than previously. Christie *et al.* (2004) questioned whether these changes might have adverse effects on students who were likely to be more vulnerable, as it increases the difference in the ways that students are taught at school or college compared to university. Some of the students in the pilot study had been the first cohort through FE studying the new AVCE award, which was introduced into further education in 2000. It was considered important to obtain the opinions of staff in FE on the first running of this course and how well they thought it prepared students for HE study.

3.2.2 Feeder institution

The seven local FE colleges that are the main feeder institutions for this university were visited and discussions with staff and students provided an overview of the FE experience in order to enhance our knowledge of the students' backgrounds and previous educational experiences.

3.2.3 Student conceptions of learning, and course and teaching preferences

The ASSIST questionnaire was used to investigate whether any patterns emerged between student conceptions of what learning means, and student characteristics such as entrance qualification or previous institution. The ASSIST questionnaire also contained a section on preferences for different types of courses and teaching. Investigation of these preferences in terms of both previous institution and entrance qualification was undertaken in order to provide an insight into the characteristics of the student body and to investigate for patterns that emerged from the data. No published work has been identified on these specific factors.

3.2.4 Approaches to learning

The approaches to learning adopted by our students were investigated in order to provide insight into whether there were patterns between their approaches to learning and other variables such as entrance qualifications, feeder institution or particular modules in SCIT. Whilst the research literature makes it clear that a student will adopt a learning style in response to their perception of the requirements of the task, there was also evidence to show that the nature of student learning in the first year in HE is likely to be influenced by the teaching and assessment régime encountered by students in their previous school or FE course (Ramsden, 2003). The approaches to learning adopted by students and the particular further education institution where they previously studied are thought to be influential in determining a student's chance of success. The ASSIST questionnaire, which is discussed in detail later (see Chapter 3, Section 3.1, and Appendix (i)) was developed by the University of Edinburgh, and used to evaluate a student's learning style and provide information on the factors that contribute to this diagnosis, e.g. lack of purpose. ASSIST aims to help staff to identify students who are experiencing difficulty with their work and enables them to investigate the ways in which their teaching is influencing student learning (Tait *et al*., 1998).

Whilst the ASSIST inventory should help to predict students who are likely to fail, poor study methods and skills are only one reason for failure (Tait and Entwistle, 1996). Other factors such as entrance qualification, feeder institution and background are thought likely to be influential in a student's chance of success and are examined in this project for patterns that may emerge.

3.2.5 Expectations and motivation

The expectations and motivation of students were considered to be important factors in a student's achievement and progression. The literature indicated that well motivated students whose expectations are matched are those most likely to succeed and that motivation is reduced for students whose expectations are not matched (Jenkins and Davy, 2003). Tracking students through Levels 0, 1 and 2 and obtaining qualitative data on their perceptions and experience of the transition to HE and their progression provided an insight into student motivation and whether their expectations had been matched.

3.2.6 Conclusions

This picture that was created from the investigation of these factors provided information that enabled the early detection of students who were at risk of being unsuccessful in Level 1. This knowledge of student factors has also provided SCIT with information as to where to target additional learning support. It is recognised that there may be differences between student knowledge, expectations and starting point, and those that teaching staff in HE expect students to have, given the increased emphasis in courses in FE towards more vocational programmes. Close liaison with staff in our local FE institutions has led to a greater understanding of the structure, content and assessment régime of the vocational courses studied by students prior to entry into HE. This information also provided the basis for the second phase of the research.

3.3 Phase two.

The second phase of this research was to investigate whether the information gathered from phase one could be used to develop appropriate intervention strategies designed to improve the students' achievements in HE. Because it sought to make improvements by intervention and was cyclical in nature, the research was therefore deemed to fall into the category of action research. Action research, according to O'Brien (1998) has two goals, one to contribute to the practical concerns of people in a situation, and two, to further the goals of social science; he stated:

> Put simply, action research is "learning by doing" – a group of people identifies a problem, does something to resolve it, sees how successful their efforts were, and, if not satisfied, tries again (O'Brien, 1998, p. 2).

Another aspect of action research is that it is collaborative in nature because a developing project will affect the practice of a circle of colleagues who inevitably become involved as the research progresses (O'Brien, 1998; Kemmis and McTaggart, 1988 and Zuber- Skerritt, 1992). Kemmis and McTaggart (1988, p. 15) stated:

> The main benefits of action research are the improvement of practice, the improvement of the understanding of practice by its practitioners and the improvement of the situation in which the practice takes place.

Kemmis and McTaggart (1988) also pointed out that action research needs to be cyclical or spiral in nature in order to achieve its full potential and that a single loop is not sufficient. Joiner, (1994) also noted that action research is cyclical or spiral in nature and can be represented by the Plan–Do–Check–Act (PDCA) model. The basic elements consist of developing a plan in order to improve the process that is taking place; acting to implement the plan; observing the effects of the action; reflecting on the effects of the action to inform further planning (Kemmis and McTaggart, 1988). This does, however, seem to presume that the process that is taking place is fully understood, in context, and those factors that impact on the process are clear. In this instance there was a need to develop a clear understanding of the process of non-traditional students entering HE computing courses and those factors that were influential in a student's progression and achievement. Zuber-Skerritt (1992, p. 11) noted: "the plan includes problem analysis and a strategic plan"; this being on the basis of the researcher's concrete experience.

According to Stringer (1999) action research consists of three distinct phases. The first phase is to look at the area of concern, building a picture and gathering information.

"When evaluating we define and describe the problem to be investigated and the context in which it is set. We also describe what all the participants (educators, group members, managers etc.) have been doing" (Stringer, 1999, p. 18). This corresponds with the 'plan' phase of Joiner's (1994) model. The second phase is to think – interpreting and explaining. "When evaluating we analyse and interpret the situation. We reflect on what participants have been doing. We look at areas of success and any deficiencies, issues or problems" (Stringer, 1999, pp. 43–44). This phase appears to encompass both the 'do' and 'check' phases of Joiner's (1994) model by means of evaluation and reflection. The third phase is to act – resolving issues and problems. "In evaluation we judge the worth, effectiveness, appropriateness, and outcomes of those activities. We act to formulate solutions to any problems" (Stringer, 1999, p. 160). Thus, in this study, action was developed from the evaluation phase that had taken place in both Joiner's (1994), and Stringer's (1999) models and it is this that has made action research such a valuable tool for educational researchers who seek to make improvements to a situation.

Methods that are considered to be eclectic combine whatever seem to be the best or most useful aspects from many different areas or approaches rather than following a single approach. Action research is generally considered to be eclectic as it draws upon the frameworks of positivism, interpretivism or both according to the requirements of a specific issue, and seeks to inform on-going improvement (Allan, 2000). Areas in this study such as gender, age, module results, entrance qualification and feeder institution drew upon the positivist approach since these variables were not open to interpretation by the researcher and could be considered reliable. Areas that drew upon the interpretivist approach were those where perceptions were involved and there could be different interpretations of what constituted reality, in the minds of the individual or subject, and in the interpretation of the researcher.

3.3.1 The collection of data.

The first part of the research, dealing with quantitative data drew on the positivist research paradigm since the data were not open to interpretation (Bassey, 1990). In order to construct a database that would allow a cohort of students to be tracked over time, a certain amount of quantitative data had to be obtained from Registry. These data included for each student, their individual student number, age, gender, previous institution, entrance qualification and whether the student held a qualification in IT. The University's on-line Student Information Tracking System (SITS) was accessed and used to obtain some of this information, but it was found necessary to manually check students' details as SITS did not record entrance qualifications in the way that was suitable for the research database. SITS banded entrance qualifications into groups, and though this is adequate for general purposes, this project required information on the specific qualification that gained the student a place on their HE course. Manually accessing the hard data held in Registry proved time consuming, but worthwhile, as it also enabled a considerable amount of cross checking and verification to take place which served to increase the authenticity of the database. The end of year module results were also obtained from Registry and were another form of quantitative data that were added to the database.

The Approaches and Study Skills Inventory for Students (ASSIST) questionnaire (Tait, *et al*., 1998)(see Appendix (i)) was used to collect qualitative data, as it is a research instrument that enables staff in HE to identify particular learning styles. It was thought appropriate to make use of a data collection instrument that had been developed specifically for this purpose. This questionnaire also helps staff to identify students who are experiencing difficulty with their studying and to investigate the ways in which their teaching is influencing their students' learning. The ASSIST questionnaire is the product of many years development work beginning with the research instrument, the Approaches to Studying Inventory (ASI) (Entwistle and Ramsden, 1983). This first instrument had two aims, firstly, to investigate the interrelationships between study habits and the constructs of deep, surface and strategic approaches to learning (see Chapter 2, Section 5) and different forms of motivation, and secondly, to describe the different ways students carry out academic tasks (Tait, *et al*., 1998). In 1992, a 60-item revised ASI (RASI) was developed which contained 15 subscales of four items each. Further work and review of studies undertaken resulted in the development of ASSIST, with 52 items, 13 subscales, 3 main scales, a section on conceptions of learning and a section on course and teaching preferences (Tait, *et al*., 1998). In a study of learning styles and their implications for pedagogy, the Learning and Skills Research Council (LSRC) (2004, p. 4) reported:

> The models of Noel Entwistle [ASSIST] and Jan Vermunt have been developed over many years with higher degree students and can safely be used to discuss with students changes in both teaching and learning.

The data resulting from the ASSIST questionnaire were qualitative in nature since students may have had different interpretations of the statements, and may well have given different responses at another time or in a different learning environment. Whilst it has been shown that a student's approach to studying does not reside within a student, but rather, varies according to his or her perceptions of the requirement of the task (Laurillard, 1979), it has also been shown that there are links between a student's approach to studying and their previous educational régime (Ramsden, 2003). For this particular reason it was felt that the use of the ASSIST questionnaire could help to identify patterns that may emerge from the students' prior educational experiences and their achievement in HE. The questionnaire required participants to respond to statements, with responses from strongly agree to strongly disagree with a central value meaning unsure or no opinion. This meant that there was no reason for participants to leave responses blank, and that all responses had a numerical code of one to five, hence quantitative methodology could be used to analyse and describe qualitative data (Joiner, 1994). This allowed description of responses in percentages or as charts, which helped to identify trends or patterns in what remains qualitative data. The data were investigated for patterns between learning styles and strategies and factors such as entrance qualification, previous institution and module results.

Students were invited to attend an informal group discussion in order to collect information on the nature of any problems or difficulties they found in their transition to HE and their progression through the first year of HE study (see Appendix (ii)). Three students attended this meeting. This was a little more structured than a focus group discussion as there were a number of questions and points that needed to be explored. This aimed to bring together the experiences, attitudes and perceptions of students who had experienced transition to, and progression through Level 1 in HE. It was hoped to gain a large amount of material in a relatively short time and to explore new ideas. These three students, from very different backgrounds, all contributed to a lively discussion, based on a semi-structured interview that was, with their consent, recorded and transcribed. It was evident that another method of obtaining qualitative data from students had to be identified and implemented. A page of open-ended questions (Appendix (iii)) that could be answered fairly quickly by students was drawn up. It was decided to attempt to get students to complete these questions in workshops towards the end of the semester. On consultation with three module leaders, workshops were identified in computer laboratories, where students would be waiting for their turn to demonstrate their completed assignment and have it marked. By appealing to their altruistic nature of giving me information that may lead to improvements being made for the benefit of future students, most were willing to complete the question sheet and chat about their experiences. Forty-six completed sheets were collected, the results of which were analysed by coding the responses, with issues being grouped into factors that fell into areas where they could be specifically addressed (see Appendix (iv)). These included pre-entry information, application, enrolment, induction, personal tutor, assessment and teaching and learning issues.

During the first year of the research, permission was obtained to visit the local FE colleges that are our main feeder institutions. This was done for three purposes:

1. to encourage the co-operation of students who were in their final year and intended to enrol on HE computing courses at the University of Wolverhampton, and to explain the purpose and reasoning behind the project;
2. to obtain data on these students' learning styles and strategies by persuading them to complete the ASSIST questionnaire;
3. to interview staff in FE and obtain information on the nature and contents of the courses studied by this cohort.

3.4 The pilot study

In order to gather information on the students' backgrounds and entrance qualifications a pilot database was set up with data from the 2002/03 cohort. Additional information on the students' progression through Level 1 was added at the end of the academic year. Statistical analysis of the data (see Chapter 4) provided an overview of the process of transition from FE to HE and progression through Level 1 in HE that was taking place. This provided information on:

- the process of collecting qualitative data from students;
- the process of collecting quantitative data from SITS or Registry;
- the statistical analysis of the data;
- the analysis of results.

Piloting the study revealed how well the techniques and methods worked in practice and then enabled the research design or methods to be modified as necessary (Blaxter *et al.,* 2001). The ASSIST questionnaire was piloted by the 2002/03 cohort in a widely taken elective module during semester one, Level 1. The project was explained to the students in order to gain their co-operation and 85 questionnaires were completed. These were incorporated into a pilot database for analysis. Background student data were obtained from Registry, which included gender, age, entrance qualification, previous educational institution and whether the students had a qualification in IT. The end of year one results on eight modules for this cohort were added to the database. These eight modules were those that had a number of students high enough ($N \geq 30$) to allow useful information to be gained from statistical analysis. This enabled an initial overview of the progress of this particular cohort in relation to their characteristics to be obtained. The pilot study is fully discussed in Chapter 4

3.5 Statement and justification of the sample size of the 2003/04 cohort

The sample was the cohort that commenced Level 1 Computing and Computer Science courses in the academic year 2003/04. By surveying as many students as possible on the same widely taken elective module as for the pilot study group, it was hoped to obtain qualitative data on learning styles, teaching preferences and perceptions of learning. This sample consisted of 84 students. End of year module results were collected for this group of students and these were analysed by entrance qualification for any trends or patterns that may emerge. In order to determine whether or not this sample was representative of the cohort, quantitative data on module results were obtained from the entire cohort at the end of Level 1, (N = 251) so that a similar analysis for trends and patterns could be carried out.

This meant that there was a database of 251 Level 1 students in the 2003/04 cohort, of whom, 84 had completed the ASSIST questionnaire. In order to track as many of these students as possible in Level 2, permission was obtained to ask the students to complete the ASSIST questionnaire in a core module. This was done in February 2005, and despite poor attendance, 53 usable, completed questionnaires were obtained from a group of 60 students. Not all of these 53 students had been in the group of 84 who had completed the questionnaire in the previous academic year, which reduced the number that could be tracked in terms of learning styles and strategies, teaching preferences and perceptions of learning. The entire cohort (N = 263) was tracked in terms of end of Level 2 module results for analysis by entrance qualification.

3.6 Statement and discussion of the response rate for the ASSIST questionnaire

Data collection from a high number and wide range of students was required in order to provide sufficient numbers for statistical analysis to provide useful results and to enhance validity. For this reason, postal questionnaires were discounted, as generally the response rate is fairly low, with first dispatch bringing up to 40% response (Cohen *et al.*, 2000). In order to maximise the response rate for the questionnaire there were five factors to consider:

- selecting a time/date when a large number of the cohort were together;
- enlisting the cooperation of a member of staff to achieve this;
- giving an overview of the project to the students, and their important role in it;
- giving the students confidence in anonymity;
- giving the students adequate time in order to complete the questionnaire.

In order to optimise the chance of getting the maximum number of students to take part, the ASSIST questionnaire was administered in a slot between two lectures, on a widely taken Level 1 elective module. The project was explained to the students in terms designed to enlist their cooperation. It was explained that the school wanted to make improvements to the learning experience of its students, especially the first year students, but that changes were more likely to be effective and useful if they were based on input from current students. They were told that the project sought to find out how they preferred to be taught, and how they preferred to do their learning. The project also wanted to investigate whether there were differences between particular groups within the cohort or not. This would enable SCIT to build in changes to its provision that would address the needs of the modern, diverse student body. The students were assured that their responses would be completely anonymous, and that their student number was required only to track them into their second year to complete another questionnaire and add that data to the first one. The students were told that they did not have to help in the project, but that we would appreciate their input. One student decided to leave, but the remainder of the group, 96 students, all completed the ASSIST questionnaire, which represented a response rate of 99%. Twelve questionnaires were spoiled or incomplete, leaving 84 that could be entered on to a database.

3.7 Validity and Reliability

3.7.1 Validity

Validity is a requirement of both quantitative and qualitative research, and researchers endeavour to maximise validity since invalid research is worthless (Cohen *et al.,* 2000). There are different kinds of validity, but both quantitative and qualitative research can address the two main types, which are internal and external validity (Cohen *et al.,* 2000). Internal validity is concerned with demonstrating that the instruments or methods used in the research measure what they are alleged to measure. Internal validity seeks to demonstrate that the findings are accurate, that they make sense, are credible and that the explanation can be supported by the data (Cohen *et al.,* 2000 and Miles and Huberman, 1994). In qualitative data analysis, triangulation is generally used to provide confidence and validity in the data whilst adding depth and greater understanding to the study. Triangulation refers to the use of two or more methods of data collection on the same phenomenon or object of study to demonstrate concurrent validity (Cohen *et al.,* 2000). Methodological triangulation is one method of increasing the validity of a study whereby the researcher can use the same method of data collection on different occasions, or use different methods on the same object of study (Cohen *et al.,* 2000). Tooley and Darby (1998) in a survey of published educational research noted that issues of triangulation (or the lack of it) were a concern and stated: "Triangulation is a way of cross-validating research. It uses methods of comparison, to help assess the validity and reliability of the data collected" (Tooley and Darby, 1998, p. 14). Mathison (1998) made the point that triangulation can reveal contradiction, inconsistency as well as convergence in data, but this can be seen as an opportunity to make sense of the phenomenon under investigation. It can also provide depth and richness to the study. Investigators generally aim to seek the truth in an issue and, while triangulation can show divergent rather than convergent evidence, it may be this that causes an investigator to search more deeply or in a different way to illuminate the issue

The qualitative data were obtained in three different forms. The first was a questionnaire with responses recorded on a modified Likert scale, which were then analysed using quantitative methodology. Secondly, a group discussion was conducted and recorded, and thirdly, short, open-ended questionnaires were used to obtain data, both of which were subsequently coded. It was not possible to use investigator triangulation in this study. Investigator triangulation is the use of more than one investigator in the research, which increases the validity of the data. There was, however, a level of time triangulation, as this was a longitudinal study where data were collected from the same cohort of students at different points in the time scale. This form of triangulation provides the data with stability over time (Cohen *et al.,* 2000).

External validity refers to the degree to which the research findings can be generalised to a wider population (Cohen *et al.,* 2000 and Blaxter *et al.,* 2001). Owing to the nature of the research, in that it involved one particular cohort, the uniqueness of the institution and the student population involved, generalisability cannot be applied to this study. The students who took part were not selected to be a representative sample, and other researchers would not be able to replicate the conditions under which data collection took place. It was not the purpose of this research to make generalisations. The findings may, however, be relatable to other wide access institutions with similar courses and student profile (Bassey, 1990). Sufficient detail has been made available in descriptors of the student characteristics, institution and courses that others may be able to relate the findings to their own situation (Bassey, 1990).

3.7.2 Reliability

Reliability is concerned with consistency and replicability in research. In quantitative research, the results should be the same if two researchers investigated the same sample using the same methods. Different researchers can generally repeat the data collection and experimental conditions time and time again and the findings remain the same. In qualitative research, however, there may be different findings for each researcher owing to the interpretative nature of questions and responses (Cohen *et al.,* 2000). Interpretivist research is usually not repeatable as the participants and their circumstances will have changed. In order to minimise mistakes and misinterpretations in this research, the coding of qualitative data obtained from students was double checked by a senior member of the research team. In this study, both qualitative and quantitative data were collected from a cohort of students over a period of three years.

Quantitative data were obtained from SITS and by manual extraction from Registry, which allowed a considerable amount of cross-checking to take place. This increased the reliability of the data. Where quantitative data were analysed, the level of significance was set at 5% ($p = 0.05$). The responses from interview and open-ended questionnaires were coded with responses placed into categories and these were check-coded by a senior member of staff for reliability.

Where the questionnaire with Likert type responses was used, the data were reduced by factor analysis. For the factor analysis, principal component analysis using Varimax rotation and Kaiser normalisation were used with Eigenvalues greater than 1 (the default setting on SPSS version 10). Principal component analysis aims to reduce and interpret data and can reveal relationships not previously identified. Varimax rotation is an orthogonal rotation and is the most commonly used method of maximising the variance of factor loadings, making low correlations lower and high correlations higher, than before rotation (Tabachnick and Fidell, 1996). The resulting transformation matrix provides a picture that is easier to interpret. Cronbach's alpha is a coefficient of reliability and is used to determine how well a set of items or variables measure a single, unidimensional latent construct. Cronbach's alpha (α) has a value of 0 – 1 and generally, internal consistency is considered satisfactory if α is > 0.7 (SPSS FAQ., 2005). For most of the factors α was satisfactory or moderate. Where α was low, the data were checked for multidimensionality, and in several cases the data were found to be multidimensional. This meant that two of the four questions did not measure the same latent construct as the other two questions in several instances, but as two separate factors, α values were acceptable. This provided an opportunity to explore the data further.

Quantitative data, such as module results that had a numerical value, were analysed by means of descriptive statistics, One Way Analysis of Variance (ANOVA) and linear regression in order to investigate for patterns between groups of students. ANOVA was used to compare the means of grade points attained by groups of students on modules studied at Level 1. Simple linear regression was used in order to investigate for a linear relationship between a response variable and a possible predictor variable by the method of least squares. The method of least squares is the most commonly used method of defining a straight line through a set of points on a scatter plot. Where these were analysed with entrance qualification as a variable, the two main entrance qualifications, A levels and AVCE, were computed to provide dummy variables. Dummy variables are dichotomous variables in which a value of 1 is assigned to the group or variable of interest and a value of 0 to those that are in the other category. This ensured that the analysis did not use the code number assigned to the variable as a numerical value. Module results were investigated using these analyses for patterns that related to student entrance qualification, previous institution and learning styles.

3.8 Ethics

Personal data covers both factual material and opinions of an individual. Any person processing (obtaining, holding and disclosing) such material must comply with the eight principles of data protection. The first principle, that data should be fairly and lawfully processed was adhered to, as the processing was necessary for the purposes of the legitimate interests pursued by the data controller. The students who took part in this study by completing questionnaires or consenting to interviews were given assurances regarding their anonymity during and after the project. Students were also clearly informed of the reasons for the research being undertaken, and of the use of the results or findings. Those students who then completed and returned questionnaires or agreed to be interviewed were deemed to have consented to the data being processed for the purposes of the project.

In order to track students it was important to obtain their student number on the questionnaires, but this would only be seen by the researcher and any auditor who may be required to check the validity of the data. The raw data was kept in a locked filing cabinet to which only the researcher had access.

The second principle, that data shall be processed for limited purposes was met as the data was collected for the purposes of this study only and will not be disclosed for any other purpose. Serious consideration was given to the amount of times that students could be expected to provide us with information, since the third and fourth principles of data protection stated that personal data should be accurate, adequate, relevant and not excessive. When student opinions were required, care was taken to design short questionnaires with a small number of open-ended questions that could be completed in a few minutes, to minimise the intrusion into student time.

The data will be destroyed following the completion of this research project, which upholds the fifth principle, and the sixth principle, that personal data shall be processed in accordance with the rights of the data subjects was complied with.

The seventh and eighth principles cover the protection of personal data from unauthorised or unlawful processing or damage, and the non-transfer of personal data to a country outside the European Economic Area. These principles were adhered to by the steps taken to comply with the preceding principles, namely by keeping personal data in a secure, locked place, by non-disclosure and by not having student identity on any material, results or findings. The students were clearly told of the researcher's role in the research and the institution, and of the end use of the research findings.

The British Educational Research Association (BERA) (1992) ethical guidelines were also adhered to throughout this study. These guidelines stressed the importance of the ethic of respect for persons, respect for knowledge, respect for democratic values and respect for the quality of educational research. In particular, the aim to avoid fabrication, falsification or misrepresentation of evidence, findings or conclusions was considered essential for this research to be useful and of value to the students and staff in SCIT. This research received approval from the School Ethics Committee on 11/12/2002.

3.9 Critique of the problems, limitations or weaknesses in the design

This longitudinal study had been planned in order to track students who were studying in FE in the academic year 2002/03 prior to entry into Level 1 in HE in 2003/04 and through Level 2 in HE in 2004/05. This required that data were collected from students in their final year on computing courses in FE, Level 1 and Level 2 in HE. Data collection from students in FE proved difficult as it depended upon liaising with staff in FE colleges to determine when the optimum time was to visit and collect data from their students. Frequently students had failed to attend on the recommended day for various reasons which resulted in numbers being lower than anticipated. Organised visits to six local FE colleges resulted in data collection from thirteen prospective students, a very small sample size. These students did not all proceed to enrol on Computing or Computer Science courses on entry to the University of Wolverhampton, some enrolled on Business and Marketing courses and others simply disappeared, hence the number available for tracking through Levels 1 and 2 reduced still further.

The on-line student database (SITS) did not store some of the student data in sufficient detail for the purposes of this project. Age, gender and previous institution were accessed from this database but the students' entrance qualifications were not recorded individually, but were banded into groups. This required that the information on entrance qualification was manually extracted from files which proved to be time consuming. This, however, became a strength of the project as manually checking student files allowed a high level of cross checking to take place and increased the reliability of the data (see Chapter 3, Section 7.2).

Data were collected from as many students as possible in each cohort. Results such as end of module grades and personal student data were available for all students but the qualitative data from the Assist questionnaire were collected from those students who attended on the particular days the survey was administered. The richness of the data was therefore reduced by not being able to obtain the views and perceptions of non-attendees.

It had been hoped that those students who completed the ASSIST questionnaire in Level 1 would also complete the same questionnaire in Level 2. Fifty-two completed questionnaires were obtained from Level 2 students, though only 20 of these students had been in the Level 1 group from which 85 usable, completed questionnaires were collected. The reasons for this were unclear, but likely to be largely due to some students specialising or moving between courses during Level 1 and Level 2.

The collection of qualitative data on students' experiences of the transition to HE proved difficult with students being reluctant to attend focus group discussions despite being offered inducements of food and drink. An alternative method, in the form of an open-ended questionnaire (see Appendix (iii)) was quickly devised to obtain this data. This questionnaire was administered during class time to obtain maximum numbers of respondents and student responses provided valuable insights to many areas. The questionnaire did not, however, have the scope to explore issues in the same way as a discussion group may have done.

Student drop-out and poor progression have been shown to be multifactorial issues (see Chapter 2, Section 4). This research did not attempt to investigate every factor since this would have been beyond its scope. Instead, it focussed on those factors which thought, from prior experience and evaluation within SCIT, to be significant for our students. Further insight into student retention and progression might be obtained with investigation of other factors such as gender and ethnicity, but this would require larger sample sizes and greater resources.

4. The pilot study

4.1 Introduction

Running a pilot study for this research allowed the opportunity to collect and analyse a small amount of data before starting to collect the main body of data. This was to reveal any problems with the methods employed at an early stage in the research. It also allowed students to complete the ASSIST questionnaire to ascertain whether they could understand and respond to the statements. Piloting also enabled the researcher to investigate which methods of statistical analysis provided findings that allowed patterns in the data to be revealed. The findings of the pilot study were used to identify factors that could be explored further in the main study.

As part of the research design, it was decided that the ASSIST questionnaire should be completed by the Level 1 cohort, during the 2002/03 academic year, in a widely taken (N > 90) elective module in November 2002. This enabled an overview to be produced of one cohort through their first year on Computing and Computer Science courses in HE. Students were told of the purpose of the study, the importance of their role in it, the use of results and findings and that they would remain anonymous at all times. Apart from ensuring that all participants were fully informed of the research and their options, this achieved the cooperation of all but two students who declined to take part. This level of participation would have been difficult to achieve by any other method.

The resulting data were compiled into a database that was then extended to include other student details such as previous institution, entrance qualification, and personal data. There were found to be significant difficulties associated with collecting students' details as the SITS database did not store the information in the required format (see Chapter 2) and this resulted in manual extraction of data from Registry. Although time consuming, this was found to be a useful method of checking and cross checking data. The end of year module results were added to the database and statistical analyses were performed using descriptive statistics, factor analysis, AVOVA and linear regression in order to determine if patterns emerged between entrance qualification, student conceptions of learning, course and teaching preferences, feeder institution, approaches to learning and achievement at Level 1.

4.2 Students' conceptions of learning.

The first six statements in the ASSIST questionnaire were about learning and what that meant to students. Students were required to indicate, by means of a Likert-type scale, whether the statements were very close or very different to their own way of thinking, where 5 was very close and 1 was very different. The groups, by entrance qualification, were analysed by ANOVA in order to determine if there were differences in the mean scores (see Table 1). For this initial analysis, entrance qualification was reduced from six groups to three groups, namely, A level, AVCE and Other, as four of the six groups had low numbers. The level of significance was set at 5% ($p = 0.05$).

Table 1. Results of one way ANOVA of students' conceptions of learning by entrance qualification (three groups)

ASSIST statement (N = 86)	**P value**
(Aa) Making sure you remember things well	>0.1
(Ab) Developing as a person	0.012
(Ac) Building up knowledge by acquiring facts and information	>0.1
(Ad) Being able to use the information you have acquired	>0.1
(Ae) Understanding new material for yourself	>0.1
(Af) Seeing things in a different and more meaningful way	0.054

The results in Table 1 showed that for four of the statements, no significant differences were seen between the groups. Statement Ab did show a significant difference, and statement Af was just outside significance. In order to investigate the differences between the three groups further, Bonferroni *post hoc* tests were used (see Table 2).

Table 2. *Post hoc* test results of comparison between entrance qualification groups for statement Ab

	Number	**Compared to A level**	**Compared to AVCE**	**Compared to Other**
A level	33		-0.45 (p = 0.085)	-0.65 (p = 0.021)
AVCE	25	0.45 (p = 0.085)		-0.19 (p >0.1)
Other	16	0.65 (p = 0.021)	0.19 (p > 0.1)	
Total	74			

The results of Table 2 showed that students with A level entrance qualification scored 0.45 less than students with AVCE entrance qualification for statement Ab, though just outside significance. It also showed that students with A levels scored 0.65 less than students with other entrance qualifications and this result was statistically significant.

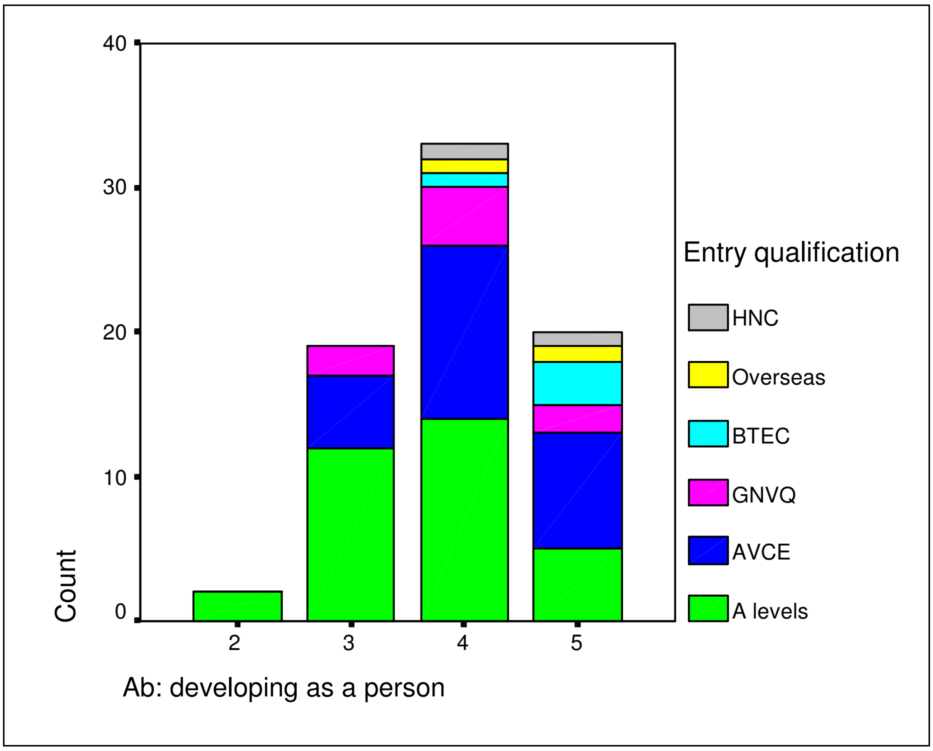
This result for statement Ab was investigated further by obtaining the means and frequencies for all six entrance qualification groups, in order to determine differences between the groups (see Table 3).

Table 3. Mean scores of groups by entrance qualification for statement Ab on ASSIST questionnaire

Entrance qualification	**Number**	**Mean score for Ab**
BTEC	4	4.8
Overseas	2	4.5
HND	2	4.5
AVCE	25	4.1
GNVQ	8	4.0
A levels	33	3.7
	Total = 74	Mean score = 4.3

Students with a BTEC qualification had the highest mean score for statement Ab (4.8), followed by those with an HND/HNC or overseas qualification (4.5). Students with A levels had the lowest mean score of 3.7. The spread of results for statement Ab vs. entrance qualification can be seen in Figure 7.

Figure 7. Chart to show results of statement Ab on ASSIST questionnaire by entrance qualification.



Further investigation of these results showed that the groups scoring the highest for this statement (Ab) were also the groups with the highest mean ages (see Table 4). This suggested that seeing learning as 'developing as a person' may be either a characteristic of a more mature learner, or it could be a characteristic of entrance qualification as Table 3 shows that the mean age of students with A levels was 19.1 years and those with AVCE had a mean age of 18.6 years. Other groups by entrance qualification had a mean age ≥ 20 years. The AVCE award was first introduced in 2000 in FE so it is likely to have attracted mainly school-leavers.

Table 4. Mean ages of students by entrance qualification

Entrance qualification	Number	Mean age in level 1 in HE
HNC/HND	2	30
Overseas	2	26.5
BTEC	4	24.5
GNVQ	8	20
A levels	33	19.1
AVCE	25	18.6
	Total = 76	Mean = 20.3

Seeing learning as 'developing as a person' (statement Ab) was a statement that reflected a view of learning that involved personal understanding and development, rather than a conception of learning as reproducing knowledge. This is associated with a deep approach, rather than a surface approach, to learning. Approaches to learning have been shown (see Biggs, 1999 and Laurillard, 2002) to be a response that arises from the way a student relates to a particular task or teaching environment, but Biggs, (1999, p. 17) also stated: "students do have predilections or preferences for this or that approach, but those predilections may or may not be realised in practice, depending on the teaching context". According to Tait *et al.* (1998) a deep approach to learning has a developmental aspect to it; hence these findings indicated that entrance qualifications and maturity might both be influential on a student's approach to learning. Further exploration of this is in section Chapter 4 Section 4.

4.3 Student preferences for different types of course and teaching.

The last nine statements in the ASSIST questionnaire were about preferences for different types of course and teaching. The students were required to indicate on a Likert type scale whether they liked or disliked statements where 5 meant "I definitely like" and 1 meant "I definitely dislike".

The data, grouped firstly by entrance qualification, and secondly by age were analysed by ANOVA in order to determine if there were differences in the mean scores of the groups. No significant differences were found for either analysis. When grouped by age, there were 14 groups with some groups containing only one student. In order to reduce the number of groups, the data were grouped into two groups with one group being 'under 21 years' and the other defined as '21 plus years'. When these two groups were analysed for their preferences for different types of course and teaching, using an independent samples t test, significant differences were found between the groups for two of the statements (Cf and Ci) on the ASSIST questionnaire (see Table 5).

Table 5. Results of one way ANOVA of students' preferences for different types of course and teaching by maturity

ASSIST statement (N = 86)	**P value**
(Ca) Lecturers who tell us exactly what to write down in our notes	>0.1
(Cb) Lecturers who encourage us to think for ourselves	>0.1
(Cc) Lecturers who show us how they think for themselves	>0.1
(Cd) Exams which allow me to show that I have thought about the course material	>0.1
(Ce) Exams or tests which need only the material provided in the lecture notes	>0.1
(Cf) Modules in which it is made very clear which learning materials we have to use	0.043
(Cg) Modules where we are encouraged to read around the subject	>0.1
(Ch) Learning material that challenge me and provide deeper explanations	>0.1
(Ci) Learning materials giving me straightforward information	0.029

Using descriptive statistics to obtain frequencies and mean scores for the groups it was found that students scoring higher for statements Cf and Ci also had lower mean ages. The statements (Ca – Ci) were all then investigated for frequencies and mean scores (see Table 6). A trend was found that showed that generally those statements that reflected a surface approach to learning scored higher by students under 21 years while statements that reflected a deep approach to learning scored higher by students over 21 years. The two groups scored statement Ca evenly and statement Cc was a neutral statement, not reflecting any particular approach.

Table 6. Scores on statements Ca - Ci on ASSIST questionnaire by maturity

Statement on ASSIST questionnaire	Approach reflected by statement	Mean score (all students)	Mean score under 21 years (N = 72)	Mean score 21 years plus (N = 14)
Ca	Surface	4.00	4.04	4.00
Cb	Deep	3.95	3.83	4.14
Cc	Neutral	3.75	3.82	3.71
Cd	Deep	3.75	3.49	4.00
Ce	Surface	3.70	3.89	3.57
Cf	Surface	4.00	4.31	3.86
Cg	Deep	3.45	3.31	3.64
Ch	Deep	3.70	3.49	3.93
Ci	Surface	4.05	4.31	3.79

These findings were similar to those on the students' conceptions of learning where a deeper approach was linked to increased maturity (see Chapter 4, Section 2). Tait *et al.* (1998, p. 263) stated: "deep approach is known to have a developmental aspect to it". Tait *et al.* (1998) also found that increases in deep approach could not solely be attributed to changes in teaching. Zeegers and Martin (2001) reported that students over 25 years old scored significantly higher on the deep approach scale and significantly lower in the surface approach scale on Biggs (1987) Study Process Questionnaire in one Australian study. Maturity may be considered as a possible addition to the student presage factors in Biggs' (1999) 3 P model of student learning.

4.4 Feeder institution

Previous institution had been recorded accurately on the database, but this gave too, many groups with samples too small ($N \leq 5$) to provide useful results by statistical analysis. A new variable was created by merging some groups to provide fewer groups. Five groups were compiled which were 'local FE'; 'other FE'; 'school'; 'overseas' and 'other'. The group 'other' included unknowns, industrial experience and other HE institutions. When module results (end grade point) were investigated in relation to students' previous institution, only one module (CP1061) showed a significant difference ($p = 0.002$) between the groups. CP1061, 'History of Computing' (see Table 7) showed that students from local FE colleges and those from 'other' previous institutions scored higher grades than students from other FE colleges, students from schools and overseas students. The reasons for this were not clear.

Table 7. Results for module CP1061 by previous institution

Previous institution	**Number**	**Mean grade point on CP1061**
Local FE	27	11.0
Other FE	10	8.4
School	23	9.3
Overseas	3	9.7
Other	11	11.6
	Total = 74	Mean grade point = 10.0

No other significant differences were found for student results at the end of Level 1 in relation to their previous educational institution.

4.5 Approaches to learning and achievement at Level 1

In order to determine if there were any patterns between students' approaches to learning and other factors such as entrance qualifications and results, the data from the ASSIST questionnaire were analysed by factor analysis (see Table 8). Factor analysis aims to describe a set of variables in terms of a smaller number of factors and elucidate the relationships between the variables. SPSS employs principal component analysis, a method of extraction that aims to reduce and interpret data. The objective of factor analysis is to identify the underlying factors or latent constructs that explain the intercorrelation between the variables (Norusis, 1993). The factor loading that appears in the table represents the proportion of the variance that is accounted for by the factor. Chronbach's alpha (α) was used to determine the internal reliability of the main scales and thirteen sub-scales. This has a value of 0 – 1 with a minimum acceptable value of 0.5, but values of < 0.6 were checked for inter-item correlation.

Table 8. Factor analysis of the 52 item ASSIST.

(N = 86)	**Factor**				**α**
	1	**2**	**3**	**4**	
Deep approach					.76
Seeking meaning		.72			.60
Relating ideas		.77			.54
Use of evidence		.86			.61
Interest in ideas		.83			.69
Strategic approach					.73
Organised studying	.81				.65
Time management	.85				.75
Alertness to assessment demands	.71				.66
Achieving	.65				.64
Monitoring effectiveness	.73				.68
Surface approach					.88
Lack of purpose			.33		.68
Unrelated memorising			.90		.62
Syllabus boundness				.92	.44
Fear of failure			.91		.77

Factor analysis in Table 8 showed separate factors describing strategic approaches (Factor 1), deep approaches (Factor 2) and surface apathetic approaches (Factor 3) as described by Tait *et al*. (1998). These results were very similar to results found by Edinburgh (Tait *et al*., 1998) except that syllabus boundness emerged as a separate fourth factor and lack of purpose, with a relatively low factor loading of .332, was only weakly associated with a surface approach to studying. Since syllabus boundness is often linked with a surface approach, the data set was investigated further. It was found that if students who had gained their entrance qualification to study in HE at an overseas institution were deselected from the database, syllabus boundness became a component of the third (surface apathetic) factor.

Where the value of Chronbach's alpha (α) was seen to be low (<0.6) the data were investigated for multidimensionality. Relating ideas (α = .54) was found to have one component though associations were relatively weak. Relating ideas comprised the following statements: -

B11. *I try to relate ideas I come across to those in other topics or other courses whenever possible.*

B21. *When I'm working on a new topic, I try to see in my own mind how all the ideas fit together.*

B33. *Ideas in course books or articles often set me off on long chains of thought of my own.*

B46. *I like to play around with ideas of my own even if they don't get me very far.*

Factor loadings were b11 (0.64), b21 (0.70), b33 (0.78) and b46 (0.50).

Syllabus boundness (α = .44) was found to have two components with b12 and b25 being seen as a separate component to b38 and b51. The statements were: -

B12. *I tend to read very little beyond what is actually required to pass.*

B25. *I concentrate on learning just those bits of information I have to know to pass.*

B38. *I gear my studying closely to just what seems to be required for assignments and exams.*

B51. *I like to be told precisely what to do in essays and assignments.*

Component 1 had factor loadings of b12 (0.89) and b25 (0.78) and component 2 had factor loadings of b38 (0.58) and b51 (0.82).

Regression analysis was used to investigate the relationship between approaches to learning using the ASSIST questionnaire and a student's entrance qualification (see Table 9).

Table 9. Approaches to learning in relation to entrance qualification.

Entrance qualification	**Deep approach**	**Strategic approach**	**Surface approach**
A levels	>0.1	-7.8 (p=0.014)	>0.1
AVCE	>0.1	>0.1	5.4 (p=0.057)

From Table 9 it can be seen that students with A levels scored 7.8 less than others on the strategic approach scale and this was highly significant. The reasons for this finding were not clear. The students with AVCE qualification scored 5.4 points higher on the surface approach scale and this was just outside significance, but thought close enough to merit inclusion.

Since student preferences for different types of course and teaching (see Chapter 4, Section 3) had shown a relationship between teaching that encouraged a deep approach to learning and age, the data were investigated for relationships between approaches to learning and age (see Table 10). Scores were obtained by descriptive statistics with the group means compared using an independent samples t test.

Table 10. Results of approaches to learning vs. maturity

Age of student	**Deep approach Mean score**	**Strategic approach Mean score**	**Surface approach Mean score**
Under 21 (N=72)	55	71	47
21 plus (N=14)	64	73	45
Significance	P < 0.001	>0.1	>0.1

These results show that there were no significant differences in the scores for a surface approach or a strategic approach between the groups. There was, however, a highly significant difference between the groups on the deep approach scale with mature students (aged 21 or over) scoring an average nine points more than their younger counterparts.

4.6 Student performance in relation to entrance qualification

Table 11 provides a summary of the results of regression analysis using dummy variables when student performance on modules was investigated in relation to their entrance qualification.

Table 11. Module results by entrance qualification.

Module	N	Credits	Overall mean grade	Mean grade (excluding AVCE / A level)	A level	P value	AVCE	P value
CP1016	39	15	6.87	7.4	-0.62 (n=23)	>0.1	-0.1 (n=10)	>0.1
CP1052	43	15	9.3	12.4	-2.8 (n=18)	0.048	-4.4 (n=17)	0.003
CP1053	66	30	8.64	9.9	-0.6 (n=32)	>0.1	-2.31 (n=24)	>0.1
CP1054	30	30	7.9	11.3	-4.4 (n=9)	0.022	-4.43 (n=14)	0.013
CP1055	45	15	11.1	11.8	-0.9 (n=18)	>0.1	-0.8 (n=17)	>0.1
CP1056	73	15	7.6	7.7	+0.54 (n=23)	>0.1	-1.09 (n=25)	>0.1
CP1057	38	30	7.4	7.8	+0.44 (n=21)	>0.1	-1.62 (n=11)	>0.1
CP1061	74	15	10.2	10.75	-0.36 (n=31)	>0.1	-1.2 (n=25)	>0.1

Two modules, CP1052 and CP1054 showed findings that were highly significant (p = 0.05) for both students with A levels and those with AVCE qualification. The module CP1052, Professional and Academic Development had two assessment tasks. A group project, involving both individual and group reports, and a portfolio that was handed in twice during the module. The students with A levels performed significantly less well than other groups except those with an AVCE qualification who achieved an average of 4.4 grade points lower than others on the module.

CP1054, Introduction to Computing and Programming, was a year-long programming module that has several assessment tasks. These comprised an electronic portfolio, an application with documentation, a phase test and an end exam. Both the students with A levels and those with AVCE qualifications performed significantly worse than other students by some 4.4 grade points. This is the core programming module for students who are studying Computing rather than those who are studying Computer Science; the latter course is considered to be more challenging by teaching staff in SCIT. It is likely that students with poorer A level grades would be required to study Computing rather than Computer Science. This would be supported by the results of CP1057, a year-long programming module and CP1056, both studied by those on Computer Science courses, where students with A levels performed slightly better than others.

It was noted that students with an AVCE qualification performed marginally better than their counterparts with A levels on CP1055, Desktop Applications, and CP1016, Computer Architecture. CP1055 is essentially a practical module, which is assessed in workshop sessions. CP1016 has three assessments, two on-line multiple-choice tests and an electronic portfolio. There are no exams or written coursework on these modules. Since the main differences between these two modules and other modules are the assessment régimes, it is possible that the nature of the assessment régime impacts on a student's performance, especially in relation to their entrance qualification. These findings are in accordance with Boud (1995) who found that students adopt particular approaches to learning according to their circumstances, prompted partly by the nature of the assessment tasks. "This response - and other undesirable ones- won't only be a function of the assessment tasks set, but of all the experiences of assessment students have had in the past" (Boud, 1995, p. 38).

Whilst other results were not statistically significant, a consistent pattern across the eight modules of weaker performance by students with AVCE qualifications merited further investigation. It was known that students on AVCE courses do not have to pass all units in order to obtain an overall pass at AVCE. It may be that some students achieved an overall pass in the AVCE when they may have failed, or opted out of fundamental units. It was also noted that students with A levels were only seen to perform better than students with other entrance qualifications in two out of eight modules. This may be a reflection of the mean A level scores achieved at by our students.

Table 12. Effects of approaches to learning on module grades.

Module	N	P value	Deep	Strategic	Surface
CP1052	43	>0.1	.16 (p= .026)	>0.1	>0.1
CP1056	73	.001	.15 (p< .000)	-.07 (p= .037)	>0.1

In order to ascertain if there was a relationship between a student's approach to learning and their module grade score, linear regression was used. This analysis showed that on two modules there was a relationship between these factors (see Table 12). On the module CP1052, for every extra point a student scored on the deep approach scale, their module grade point increased by 0.16. Similar findings were seen on CP1056 where the module grade point was increased by 0.15 for every extra point scored on the deep approach scale, but reduced by 0.07 of a grade point for every extra point on the strategic approach scale. The reasons for the deep approach findings were not clear though both modules included a portfolio in their assessment tasks and this required students to engage and re-engage with their work more frequently and so encouraged a deeper approach to studying. Students may have seen electronic phase tests and portfolio as requiring a marginally less strategic approach than paper-based assessments, though other reasons for this may emerge over time in this longitudinal study. Other analyses of module grades and approaches to studying produced results that were not statistically significant but were repeated in the following year (see Chapter 5). Low student numbers on the database may be one reason for a lack of significance in the results.

4.7 Conclusions

Conducting the pilot study enabled an overview to be developed of the nature of the impact of a student's previous educational experience on their progression, by performance on modules, in Level 1 in HE for this particular cohort (see Chapter 4, Section 6). It was hoped that the findings would relate to the results for the subsequent cohort and be of assistance in interpreting those findings. The pilot study also enabled the researcher to examine methods of data collection and to determine how best to collect qualitative data on issues that may have relevance to the findings. The findings also prompted a staff seminar that provided an opportunity to discuss the results, and to seek the opinions of teaching staff on the reasons for the patterns seen in the results.

The data on entrance qualifications, approaches to learning and module results at Level 1 produced patterns indicating that students with an AVCE entrance qualification were at increased risk of poor performance on the eight modules examined for this cohort. This finding supported the conceptual framework of the project, which theorised that entrance qualification might be an early indicator of students at risk of being unsuccessful in their studies. The performance of students with A levels was inconsistent across the eight modules examined and was thought to merit further investigation, i.e. by points score. Whilst many possibilities were considered, it might be that those with poorer grades pursue Computing courses and could possibly be at risk of under performing due to low self-esteem and poor study skills while those with better grades at A level enter Computer Science courses and are better prepared, both academically and psychologically to meet the challenge.

4.7.1 Points that emerged from the pilot study

- Age and entrance qualification may be factors that are influential in a student's conceptions of learning.

- Age may be an influential factor in a student's approach to learning

- The feeder institution attended by the student was not found to be a factor in a student's performance in Level 1 in HE for this cohort

- Entrance qualification may be a factor that affects a student's performance in Level 1 in HE.

- The assessment régime encountered by the student may be a factor in student performance in HE.

5. Presentation, analysis and discussion of results

5.1 Phase one

The initial aim of this research was to enable early detection of students at risk of poor performance in HE by investigating the data set for patterns that may emerge between student achievement at Level 1 and the following factors:

- entrance qualification;
- feeder institution;
- approaches to learning;
- student conceptions of learning;
- student course and teaching preferences;
- student motivation.

Phase one examines the findings of each of these factors in turn.

5.1.1 Investigation of entrance qualifications and achievement at Level 1

Students in the 2002/03 and 2003/04 cohorts entered Computing and Computer Science courses at this institution with a range of entrance qualifications that included traditional A levels, the vocational A level (AVCE), BTEC, GNVQ, Access, HND/HNC, overseas qualifications and prior experience. Prior experience is often industrial in nature and is classed as ‘other qualification’ for the purposes of this project. The two largest groups were the A level and AVCE students. These made up approximately 42% and 35% of the student body respectively for the 2003/04 cohort. The other entrance qualifications totalled less than 25%, having percentages ranging from 2-7%. Table 13 provides a summary of the results of regression analysis using dummy variables when student performance on eight modules was investigated in relation to the student’s entrance qualification for the 2003/04 cohort at Level 1.

Table 13. Module results by entrance qualification

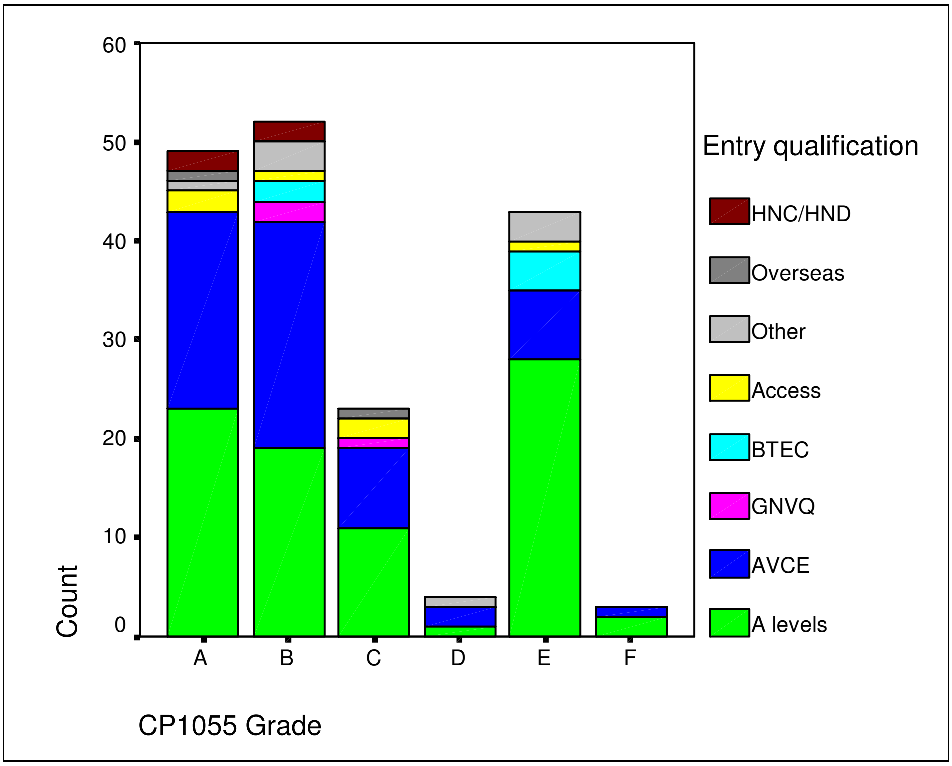
Module	N	Credits	Overall mean grade	Mean grade (excluding AVCE / A level)	A level	P value	AVCE	P value
CP1016	116	15	6.8	7.1	+0.18 (n=51)	>0.1	-1.44 (n=36)	>0.1
CP1052	92	15	7.8	6.9	+1.4 (n=31)	>0.1	+0.73 (n=35)	>0.1
CP1053	213	30	7.1	6.4	+1.5 (n=89)	0.04	+0.16 (n=74)	>0.1
CP1054	62	30	6.6	4.8	+3.0 (n=19)	0.03	+2.7 (n=22)	0.04
CP1055	178	15	10.1	9.3	+0.11 (n=84)	>0.1	+2.0 (n=61)	0.04
CP1056	172	15	7.8	7.7	+0.76 (n=72)	>0.1	-0.46 (n=55)	>0.1
CP1057	102	30	7.7	8.9	-0.53 (n=51)	>0.1	-3.0 (n=29)	0.03
CP1061	103	15	8.6	8.0	+0.72 (n=48)	>0.1	+1.13 (n=24)	>0.1

From Table 13 it can be seen that students with an AVCE entrance qualification performed less well than those with A levels on all but two of the eight modules examined. The differences in the performance of students with an AVCE compared to those with A levels were less marked than those found in the pilot study, though the trend was similar. It was necessary to consider factors that may have been influential in reducing the difference in performance. It may simply have been that this cohort comprised students with greater ability or better preparation than the previous cohort. The previous cohort, however, had been the first to study the AVCE award and discussion with staff in FE colleges revealed that the award was reviewed and altered after its first running. The number of assessments had been reduced, as had some of the content. This meant that the students on the second running of the AVCE award may have studied a course that prepared them better for HE study. The Level 1 modules that were examined in the table may not have been run in an identical manner for both cohorts. CP1016, Computer Architecture (15 credits), CP1052, Professional and Academic Development (15 credits) and CP1053, Information System Analysis (30 credits) were the only modules that underwent no changes between the 202002/03 and 2003/04 iterations.

CP1054, Introduction to Computing and Programming (30 credits) had some material removed as the module leader considered there to be an excessive amount of material to be covered. This required minor modifications only and the module leader hoped this would result in improved student performance. Whilst it was noted that the number of students on the 2003/04 database had increased from that of the pilot group (N = 62 and N = 30 respectively), both AVCE and A level students had incurred a small increase in their mean grade point on the module.

CP1055, Desktop Applications (15 credits) is notable for the reason that in the pilot study, AVCE students performed slightly better than students with A levels. This finding was repeated as AVCE students achieved an average of 2.2 grade points more than other students in the 2003/04 cohort, a result that was statistically significant ($p = 0.025$). The spread of grades by entrance qualification can be seen in Figure 8. This module had had the assignment made easier by including a reduced amount of programming and removal of the test plan. The assessments were all practical in nature. CP1055 is a workshop based practical module that requires students to work through set exercises and tasks on a weekly basis using resource-based learning materials. It was thought that this style of working and assessment might be more in-line with that experienced by students who had previously studied the AVCE award.

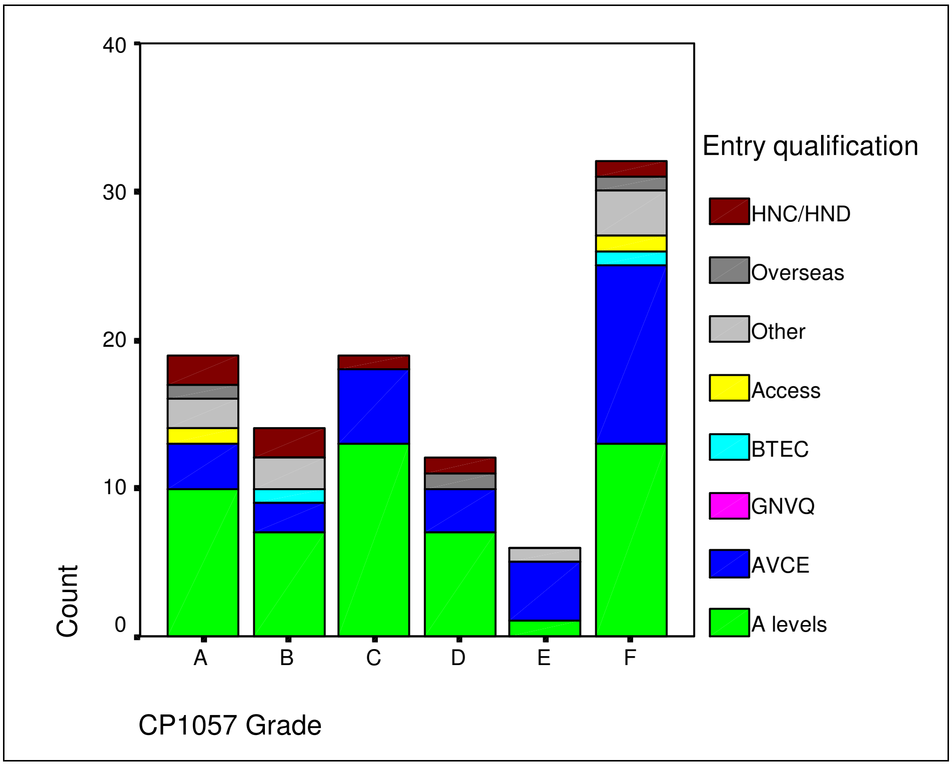
Figure 8. Chart to show module grade vs. entrance qualification on CP1055



CP1056, Operating Systems and Networks (15 credits) had only undergone one minor change between the 2002/03 and 2003/04 iterations. The electronic portfolio that had formerly been marked every two weeks (six hand-ins) had now been reduced to five hand-ins. A small but not statistically significant improvement was seen to the module marks for both A level and AVCE students though the reasons for this were unclear.

CP1057, Programming for Computer Scientists (30 credits) had undergone changes to its assessment régime between the 2002/03 and 2003/04 iterations. Software had been used to generate individual assignments to prevent collusion. Collusion, in the opinion of the module leader, had been a problem in previous years. It was felt that individual assignments may have created a new problem in that some students were outsourcing via the internet. The 2003/04 cohort showed a grade point for AVCE students of some 3.6 points ($p = 0.01$) below that of other students. The spread of grade points by entrance qualification can be seen in Figure 9. This module was considered to be challenging and required a level of problem solving, analysis and application in a range of assessment methods, which included a closed book examination.

Figure 9. Chart to show module grade vs. entrance qualification on CP1057



CP1061, History of Computing (15 credits) had undergone several changes as the module leader had felt that the assignment was too broad. The 2002/03 cohort had included group work as one of its key skills (learning outcome 4) with the assessment comprising an individual essay, a group presentation and an individual report. The decision was made to focus on essay writing, referencing and researching whilst leaving group work to other modules. The 2003/04 cohort undertook research for an essay and created a portfolio of that research. In an effort to enable students to engage more effectively with the material, elements of reflection had been included in the portfolio brief. Whilst little difference was seen in the overall module marks, the students with an AVCE qualification had improved to achieve just over a grade point more than others on the 2003/04 iteration (as opposed to over a grade point less than others in 2002/03) though this was not statistically significant.

It was noted that the module CP1055, where students with an AVCE qualification had performed significantly better than their counterparts with A levels, had involved weekly tasks that ensured students engaged regularly with their work, but in a highly structured way. This was thought to be similar to the régime encountered by students on AVCE courses. These findings were disseminated to teaching staff in SCIT so that they might reflect on their teaching and assessment régimes and possibly introduce modifications that may bring about improved student performance.

From these findings it was concluded that students with an AVCE award were likely to perform less well than their counterparts with A levels. It was also considered that the nature of the assessment régime may have been influential in student performance. Teaching and assessment are both factors in the teaching context based presage factors, and prior knowledge and ability are both factors in the student based presage factors of Biggs' (1999) 3 P model (see Chapter 2, Section 2). The model shows how these factors interact and affect the learning focussed activities, which then affect the learning outcomes achieved by the students. Since, in one class at one time, the students generally experience the same teaching context in HE, it is possible that the differences between the ways that groups responded to the situation lay in the student based presage factors. The nature of assessment in FE and HE (Level 1) emerged as an issue that merited further investigation. It was felt that staff in HE had little knowledge of the assessment régimes employed in FE, and that staff in FE were unlikely to be aware of the types of assessments that their students would encounter in HE. It was decided to set up a project to compare the nature of pre-entry assessment in FE feeder colleges with those of the first year degree programme. This involved increased dialogue and liaison with colleagues in FE and was designed to lead to improvements in assessment régimes in HE by taking account of the types of assessment that students had been familiar with on their previous courses. The project, undertaken in collaboration with a senior member of SCIT teaching staff, was a case study that ran alongside the action research in this study, and fed back into the action research cycle.

5.1.2 Investigation of the effects of feeder institution and achievement at Level 1

No significant differences were found when the students' results at the end of Level 1 were analysed in terms of the feeder institution they had previously attended. Each local feeder college had been entered separately on the database whereas FE institutions outside the local area had been entered as a single variable (other FE). Student groups from local FE colleges ranged in number from 5 to 17, while the 'other

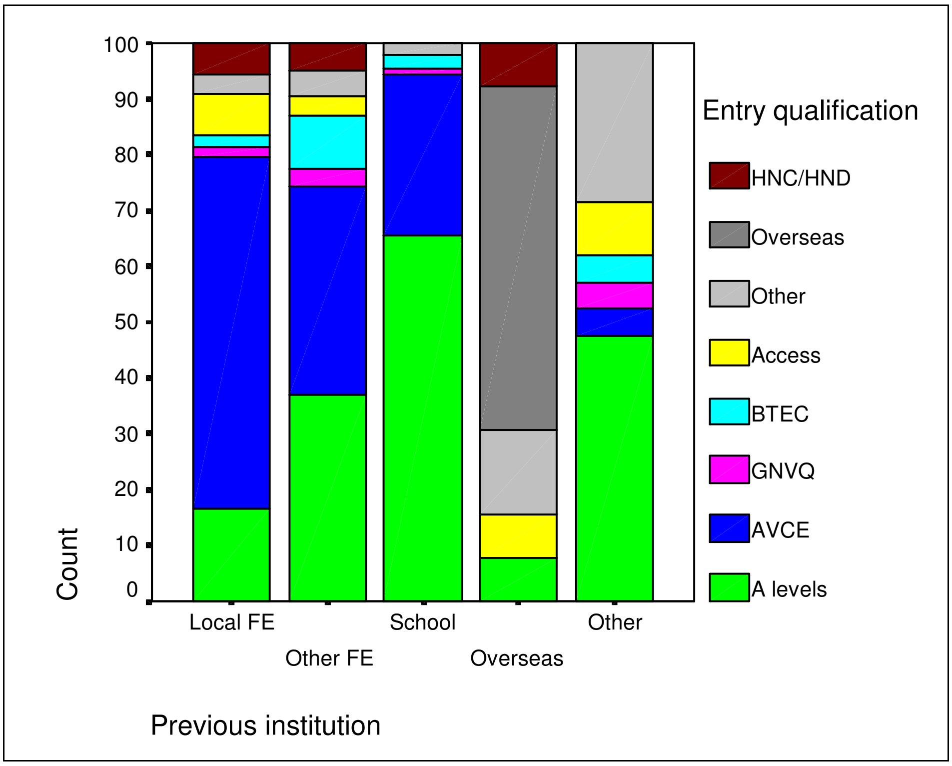
FE' group numbered 66 students. In order to determine whether low numbers had affected the statistical analysis, a separate variable was set up that combined the data from students from local feeder institutions. This formed a set of 55 students (see Table 14), making statistical analysis more reliable.

Table 14. Previous institution attended by the 2003/04 cohort

Previous institution	Frequency	Percent
Local FE	55	21.6
Other FE	66	25.9
School	91	35.7
Overseas	20	7.8
Other	23	9.0
	Total = 255	Total = 100

The results of further analysis were unchanged; indicating that the feeder institution attended by a student did not have a significant effect on their performance at Level 1. Previous studies have shown that there are difficulties fostering and supporting learning where students come from non-traditional backgrounds and their previous educational experience is varied (see Bamber and Tett, 2000; McInnis, 2001 and Zeegers and Martin, 2001). It was not immediately clear from the data why students from a more traditional school background had performed no differently to their counterparts from FE colleges, but further investigation of the data set revealed that students were studying vocational courses and A levels in both schools and colleges (see Figure 10).

Figure 10. Chart to show courses studied by previous institution as a percentage



65% of students from a school background had traditional A levels, but A levels were also a significant proportion of the entrance qualifications of students from all other backgrounds, though for only 5% of overseas students. AVCE qualifications were achieved by 65% of students from local FE colleges where 15% gained A levels. 35% of students from other FE institutions had A levels and 40% had AVCE qualifications.

The institutions previously attended by students were investigated for their effects on students' conceptions of learning and their preferences for different types of course and teaching methods. This is detailed in Chapter 5, Section 1. 4.

The seven local FE institutions, that provided more than 20% of the intake onto SCIT courses, all offered a wide range of both academic and vocational courses and aimed to serve all sectors of the local population. No differences were found between these colleges in the nature and level of support and guidance available to students.

It was concluded that the previous institution attended by students entering computing courses in SCIT had not been significantly influential in a student's chances of successful progression.

5.1.3 Investigation of the approaches to learning adopted by students

Factor analysis of the 52 question ASSIST questionnaire (see Appendix (i)) was undertaken during November 2003 (see Table 15). This was done on the same widely ($n > 90$) taken elective module as for the pilot study November 2002.

The factor pattern that emerged was the three factor pattern, which is, according to Tait *et al.* (1998, p. 268) "the most consistent and conceptually interpretable factor pattern". Chronbach's alpha (α) was used to determine the internal reliability of the three main scales and the thirteen sub-scales. Where this value was considered low (< 0.6) the data were investigated for multidimensionality.

Table 15. Factor analysis of the 52 item ASSIST questionnaire for 2003/04 cohort

(N=84)	**Factor**			
	1	**2**	**3**	**α**
Deep approach				.76
Seeking meaning		.66		.61
Relating ideas		.80		.48
Use of evidence		.84		.58
Interest in ideas		.82		.58
Strategic approach				.86
Organised studying	.79			.62
Time management	.75			.71
Alertness to assessment demands	.78			.64
Achieving	.62			.57
Monitoring effectiveness	.72			.69
Surface apathetic approach				.68
Lack of purpose			.54	.70
Unrelated memorising			.88	.53
Syllabus boundness			.43	.41
Fear of failure			.86	.77

Relating ideas (α = .48) was found to have only one component, but two of the questions (B11 and B46) had a weaker association (factor loadings of .46 and .57 respectively) than B21 (.70) and B33 (.75). Factor loadings are the correlation coefficients between the variables and the factors in a range from –1 to +1. A factor is interpreted from the variables that are highly correlated with it or have high loadings. Factor loadings of >0.6 are considered high and loadings of <0.4 are considered low (Tabachnick and Fidell, 1996).

Relating ideas comprised the following statements: -

B11. *I try to relate ideas I come across to those in other topics or other courses whenever possible.*

B21. *When I'm working on a new topic, I try to in my own mind how all the ideas fit together.*

B33. *Ideas in course books or articles often set me off on long chains of thought of my own.*

B46. *I like to play around with ideas of my own even if they don't get me very far.*

Use of evidence (α = .58) was found to have one component with each of the individual statements having loadings of > .6. Use of evidence comprised the following statements: -

B9. *I look at the evidence carefully and try and reach my own conclusions about what I am studying.*

B23. *Often I find myself questioning things I hear in lectures or read in books.*

B36. *When I read, I examine the details carefully to see how they fit in to what's being said.*

B49. *It's important for me to be able to follow the argument, or to see the reason behind things.*

Factor loadings were B9 (.69); B22 (.64); B36 (.61) and B49 (.72).

Interest in ideas (α = .58) was also found to have one component with one question (B13) having a weaker association (.45) than the other three questions. Interest in ideas comprised the following statements: -

B13. *Regularly I find myself thinking about ideas from lectures when I'm doing other things.*

B26. *I find that studying academic topics can be quite exciting at times.*

B39. *Some of the ideas I come across on the course I find really gripping.*

B52. *I sometimes get 'hooked' on academic topics and feel I would like to keep on studying them.*

Factor loadings were B13 (.45); B26 (.69); B39 (.70) and B52 (.81).

Achieving (α = .57) was found to have two components with B24 seen as a separate component to the other three statements that formed component 1. The α value increased to .67 when B24 was removed from the reliability analysis. This indicated that students had responded in a different way to statement B24 than they had to the other three statements (B10, B37 and B50). Achieving comprised the following statements: -

B10. *Its important for me to feel that I'm doing as well as I really can on the courses here.*

B24. *I feel that I'm getting on well, and this helps me to out more effort into the work.*

B37. *I put a lot of effort into studying because I'm determined to do well.*

B50. *I don't find it at all difficult to motivate myself.*

Factor loadings for component 1 were B10 (.84), B37 (.80) and B50 (.73) with component 2, B24 (.98). Further investigation of B24 by means of frequencies showed that 78 out of 84 students (90.5%) had responded with either a 4 or a 5, with 5 meaning 'I definitely agree' and 4 meaning 'I agree'. When the remaining three statements were similarly investigated, lower numbers of students had responded in a similar way. For statement B10, 67/84 (80%) of students recorded a 4 or a 5; for statement B37, 46/84 (55%) of students recorded a 4 or a 5 and for statement B50, 28/84 (33%) of students recorded a 4 or a 5. This finding indicated that students clearly recognised the value of their own personal feelings of doing well in terms of their motivation. This reflects findings by Mackie (2001) (see Chapter 2, Section 4) who reported on the importance of positive feedback on a student's level of commitment.

Unrelated memorising (α = .53) was found to have a single component, with one question (B32) only weakly associated with the other three (.39). Unrelated memorising comprised the following statements: -

B6. *I find I have to concentrate on memorising a good deal of what I have to learn.*

B19. *Much of what I'm studying makes little sense: its like unrelated bits and pieces.*

B32. *I'm not really sure what's important in lectures, so I try to get down all I can.*

B45. *I often have trouble making sense of the things I have to remember.*

Factor loadings were B6 (.61); B19 (.72); B32 (.39) and B45 (.83).

Syllabus boundness (α = .41) had two components with B12 seen as a separate component. Syllabus boundness comprised the following statements: -

B12. *I tend to read very little beyond what is actually required to pass.*

B25. *I concentrate on learning just those bits of information I have to know to pass.*

B38. *I gear my studying very closely to just what seems to be required for assignments and exams.*

B51. *I like to be told precisely what to do in essays or other assignments.*

Factor loadings were, for component 1, B12 (.90) and for component 2, B25 (.66); B38 (.64) and B51 (.73).

It was noted that the fourth factor that had been evident in the pilot study (syllabus boundness) was not seen with this sample. This had been attributed to students whose previous education had been at an overseas institution but examination of this particular database revealed that fewer students with an overseas qualification had completed the ASSIST questionnaire; hence no conclusions could be drawn from this.

Using dummy variables, regression analysis of approaches to learning in relation to A level and AVCE entrance qualifications was undertaken (see Table 16). It was found that students with an AVCE were not significantly different to other groups although they scored 6.6 points more on the strategic approach scale, a result that was close to significance (p = 0.056). Students with A levels scored slightly, but not significantly less on both the strategic and surface approach scales, but did score significantly less than others on the deep approach scale. It was notable that neither of the two main entrance qualifications appeared to have fostered a deep approach to learning in this cohort compared to other groups, but they had not shown an increase in the surface approach either.

Table 16. Approaches to learning in relation to entrance qualification

	Mean score for all students	**A level (N = 39)**	**AVCE (N = 19)**
Approach			
Deep	54.3	P = 0.034 (-4.6)	>0.1
Strategic	67.1	>0.1	P = 0.056 (+6.6)
Surface	47.9	>0.1	>0.1

The effects of approaches to studying in relation to module grades were investigated by regression analysis (see Table 17). The modules generally showed no significant difference in grade point in relation to the students' scores on the approaches to studying scales, with the exception of three.

Table 17. Effects of approaches to studying on module grade point

Module	**N**	**P value**	**Deep**	**Strategic**	**Surface**
CP1052	92	0.063	0.19 (p= 0.022)	>0.1	>0.1
CP1055	178	0.042	>0.1	>0.1	1.3 (p=0.026)
CP1057	102	0.147	0.31 (p=0.054)	>0.1	>0.1

The results in Table 17 showed that on the module CP1052, Professional and Academic Development, for every extra point scored on the deep approach scale, the module grade point achieved by that student increased by 0.19.

CP1057, Programming for Computer Scientists, had a similar result, which, though just outside significance, was considered close enough to merit inclusion. On this module, for each extra point on the deep approach scale, the student's module grade point increased by 0.31.

Whilst CP1052 and CP1057 were very different modules with the former being a 15 credit skills module and the latter being a 30 credit core Computer Science module, they both embraced a range of teaching and assessment methods.

CP1057 was considered by staff to be a challenging module that ran over two semesters in Level 1. This module was assessed by means of four multiple choice tests, a practical software development project and a closed book end exam. CP1052, considered to be a less challenging module by staff, was an elective module that was assessed by means of group work with individual and group reports and a module portfolio that involved continual hand-ins. The nature of the work in both modules, with group work and a portfolio in one and project development in the other, was likely to promote a high level of engagement with the material, which is known to foster a deeper approach to learning (see Biggs, 1999 and Laurillard, 2002).

Ramsden (2003) reported that it was important to find ways of enabling students to develop as learners rather than to explain how they should be learning, and stated: "This in turn implies that we must make special efforts to design learning contexts for first year students which rapidly develop more sophisticated approaches to academic learning" Ramsden (2003, p. 66). Irons and Alexander (2004) reported that portfolios have been found to decrease plagiarism and increase motivation by giving students ownership of the work. Biggs (1999) was also positive about the merits of using portfolios as part of the assessment régime while Race (1995) noted that students were able to demonstrate reflection and development in a portfolio. This use of portfolio, coupled with group work, which promotes student interaction and dialogue, is known to enhance a deeper approach to learning (see Biggs, 1999 and Laurillard, 2002). The use of both theory and practical elements in CP1057 enhanced the likelihood of students' being able to link theory to practice and reduced the chances of rote learning taking place.

On the module CP1055, Desktop Applications, the finding was that for each extra point scored on the surface approach scale, the module grade point increased by 1.3.

This module, not considered challenging by staff, was entirely workshop based with tutor support, and used resource-based learning techniques and practical demonstrations. The two assessments were both practical in nature and no group work was involved. The resource materials were such that a student who completed all the set tasks would have little difficulty in completing the assignments. Students may have perceived this module as not requiring large amounts of understanding, but rather, that a grasp of ideas and the ability to produce a result would suffice.

Although the approaches to studying scores in relation to entrance qualification had shown little difference between the groups, the entrance qualification in relation to these three modules was investigated (see Table 18). It was found that on the two modules that, by the nature of the tasks, promoted engagement and fostered a deeper approach to learning (CP1052 and CP1057), those students with A levels performed better than their counterparts with AVCE qualification. Conversely, on the module CP1055, where a higher score on the surface approach scale was linked to an increased grade point, students with an AVCE award performed better than those with A level qualifications. These findings were not supported by the findings in Table 16, they were, however, similar to the findings of the pilot study and were based on a combination of data types (qualitative and quantitative) rather than just the data acquired from the ASSIST survey. The latter were essentially qualitative in nature and based solely on student perceptions.

Table 18. Grade point by entrance qualification for CP1052, CP1055 & CP1057

Module	Entrance qualification	Number (< 6 in ( ))	Mean grade point
CP1052	A level	31	8.5
	AVCE	35	7.6
	GNVQ	(2)	8.0
	BTEC	(2)	4.0
	Access	6	6.7
	Other	9	6.9
	Overseas	(1)	12.0
	HNC/HND	(2)	9.5
CP1055	A level	84	9.5
	AVCE	61	11.3
	GNVQ	(3)	11.0
	BTEC	6	6.5
	Access	6	10.5
	Other	8	8.3
	Overseas	(2)	11.5
	HNC/HND	(4)	12.5
CP1057	A level	51	8.3
	AVCE	29	5.8
	GNVQ	(0)	0
	BTEC	(2)	7.5
	Access	(2)	8.5
	Other	8	8.5
	Overseas	(3)	7.6
	HNC/HND	7	10.3

The data were investigated for relationships between approaches to learning and age (see Table 19). Scores were obtained and the group means (‘under 21’ and ‘21 plus’) compared using an independent samples t test.

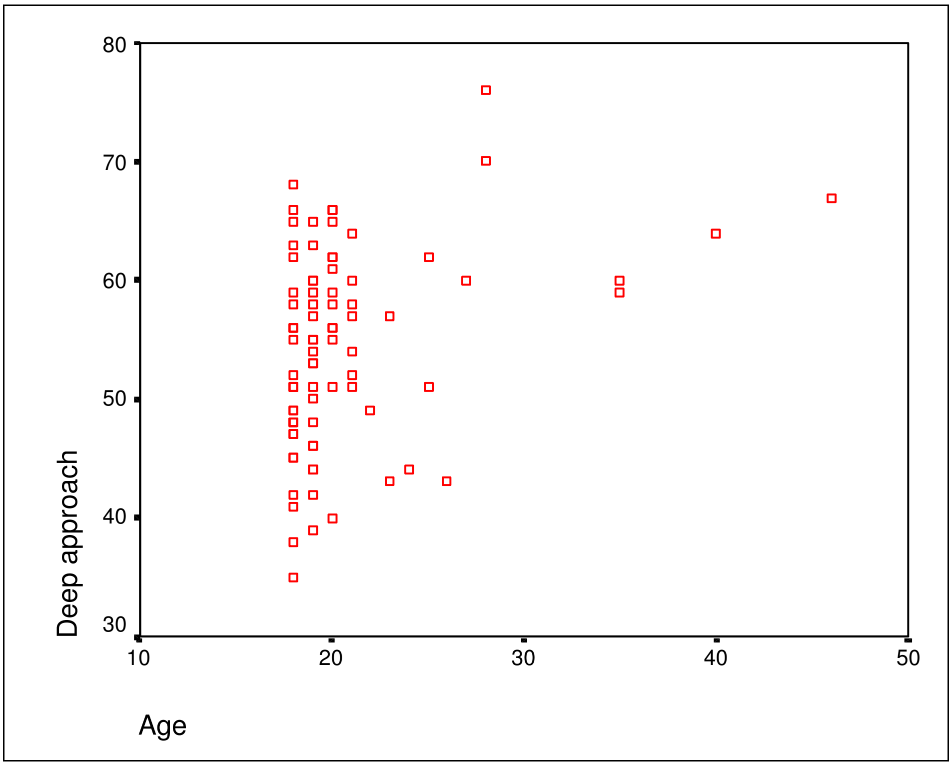
Table 19. Results of approaches to learning vs. age

Age of student	Number	Deep approach Mean score	Strategic approach Mean score	Surface approach Mean score
Under 21	63	53	67	48
21 plus	21	57	68	47
P value		P = 0.06	>0.1	>0.1

Mean scores on the surface and strategic approach scales were similar for both groups. The scores on the deep approach scale showed a mean difference of 4 points with mature students scoring higher, though this was just outside significance (p = 0.06).

When deep approach was analysed by age using linear regression the result was highly significant (p = 0.002). The spread of results is shown in Figure 11. These findings are similar to those of the pilot study, which showed that older students scored higher on the deep approach scale.

Figure 11. Scatter plot to show scores on the deep approach scale using the ASSIST questionnaire vs. age



One conclusion that can be drawn from these findings is that a student's approach to learning is an extremely complex area where many factors interact. It did reflect Biggs' (1999) 3 P model of learning and teaching where student factors such as prior knowledge, ability and motivation interact with the teaching context of objectives, assessment, climate/ethos, teaching and institutional procedures to generate learning focussed activities. These activities, appropriate/deep or inappropriate/surface, produce the structure and detail of the learning outcomes achieved by the student (Biggs, 1999). It had been seen that groups of students responded differently to different teaching contexts and that the learning focussed activities they encountered. This concurred with the findings of Prosser and Trigwell (1999) who added ‘previous experiences of learning and teaching’ to the student characteristics part of the presage factors in their modification of Biggs’ (1999) 3 P model. Prosser and Trigwell (1999) also added ‘students’ perceptions of the learning and teaching context’ as another step in the model where factors interact. Biggs (1999) also reported that students did have a preference or predilection for adopting a particular approach, though the realisation of this may be dependent on the teaching context. McCune and Entwistle (2000, p. 1) stated: “it was essential to recognise that approaches contained elements of both individual stability and contextual variability”.

Students’ prior experiences and perceptions of learning and teaching contexts were thought likely to have been influential in the learning outcomes achieved by these different groups. It was also concluded that these two factors were influential in a student’s progression in HE.

5.1.4 Investigation of students’ conceptions of learning

Data on student conceptions of learning were obtained using the respective sections on the ASSIST questionnaire, which had Likert type responses. Comparing the mean values between the students, grouped by previous institution, using ANOVA, there were no significant differences in students' conceptions of learning in relation to the student's previous institution.

The mean values of students' conceptions of learning, grouped by entrance qualification, were compared using ANOVA. This analysis showed that there were no significant differences in student conceptions of learning between the groups.

As the pilot study had indicated a difference in student conceptions of learning by age, the students were grouped by age as 'under 21 years' and '21 plus years'. The mean values of these groups were compared using an independent samples t test and this revealed no significant differences between the groups in student conceptions of learning.

5.1.5 Investigation of students' preferences for different types of course and teaching

The last nine statements in the ASSIST questionnaire were about preferences for different types of course and teaching. Students were required to indicate their preferences on a Likert type scale, where 5 meant "I definitely like" and 1 meant "I definitely dislike". The groups, by entrance qualification, were analysed by ANOVA in order to determine if there were differences in the mean scores between the groups. For this initial analysis, entrance qualification was reduced from six groups to three groups, namely, A level, AVCE and Other, as four of the six groups had low numbers (see Table 20). The level of significance was set at 5% ($p = 0.05$).

Table 20. Results of one way ANOVA of students' preferences for different types of course and teaching by entrance qualification (three groups)

ASSIST statement	P value
(Ca) Lecturers who tell us exactly what to write down in our notes	>0.1
(Cb) Lecturers who encourage us to think for ourselves	>0.1
(Cc) Lecturers who show us how they think for themselves	>0.1
(Cd) Exams which allow me to show that I have thought about the course material	>0.1
(Ce) Exams or tests which need only the material provided in the lecture notes	>0.1
(Cf) Modules in which it is made very clear which learning materials we have to use	>0.1
(Cg) Modules where we are encouraged to read around the subject	0.004
(Ch) Learning material that challenge me and provide deeper explanations	0.04
(Ci) Learning materials giving me straightforward information	>0.1

The result for statement Cg was highly significant and differences between the groups were investigated further using Bonferroni *post hoc* tests (see Table 21).

Table 21. *Post hoc* tests results of comparison between entrance qualification groups for statement Cg

	Number	Compared to A level	Compared to AVCE	Compared to Other
A level	39		-0.42 (p >0.1)	-0.89 (p = 0.003)
AVCE	19	0.42 (p >0.1)		-0.47 (p >0.1)
Other	22	0.89 (p = 0.003)	0.47 (p > 0.1)	
Total	62			

The results in Table 20 showed that students with A levels scored lower than both AVCE and 'Other' students, but significantly lower than those with 'Other' entrance qualifications.

The result for statement Ch was also highly significant. This result was also investigated further using Bonferroni *post hoc* tests (see Table 22).

Table 22. *Post hoc* tests results of comparison between entrance qualification groups for statement Ch

	Number	Compared to A level	Compared to AVCE	Compared to Other
A level	39		<0.1 (p >0.1)	-0.58 (p = 0.068)
AVCE	19	<0.1 (p >0.1)		-0.65 (p = 0.087)
Other	22	0.58 (p = 0.068)	0.65 (p = 0.087)	
Total	62			

These results were above the 5% level of significance, but nevertheless, indicated a trend where students with A levels again scored lower than other students for statement Ch. Both statements (Cg and Ch) reflected a preference for a deeper approach to learning. These findings reflected the findings of the pilot study, which showed that, where there was a significant difference between the groups, students with A levels had generally scored lower than others on statements that indicated a preference for a deeper approach to learning.

The groups, by entrance qualification (all six groups), were analysed by ANOVA in order to determine if there were differences in the mean scores between the groups (see Table 23).

Table 23. Results of one way ANOVA of students' preferences for different types of course and teaching by entrance qualification (six groups)

ASSIST statement	P value
(Ca) Lecturers who tell us exactly what to write down in our notes	>0.1
(Cb) Lecturers who encourage us to think for ourselves	>0.1
(Cc) Lecturers who show us how they think for themselves	>0.1
(Cd) Exams which allow me to show that I have thought about the course material	>0.1
(Ce) Exams or tests which need only the material provided in the lecture notes	0.09
(Cf) Modules in which it is made very clear which learning materials we have to use	>0.1
(Cg) Modules where we are encouraged to read around the subject	0.004
(Ch) Learning material that challenge me and provide deeper explanations	>0.1
(Ci) Learning materials giving me straightforward information	>0.1

Apart from statement Cg, there were no significant differences between the groups. Statement Cg did show a highly significant difference ($p = 0.004$). Descriptive statistics were used to explore this result further (see Table 24).

Table 24. Mean scores of groups for statement Cg on ASSIST questionnaire

Entrance qualification	Mean age of students	Number	Mean score for Cg on ASSIST
A levels	19.1	39	2.8
AVCE	19.1	19	3.2
BTEC	19.9	3	2.3
GNVQ	20.8	4	4.5
Overseas	22.1	1	N/a
HND	22.7	2	3.5
Other	25.9	9	3.7
Access	28.1	3	3.7

Students with BTEC qualification scored lowest (2.3) for this statement, with A level students scoring 2.8 and AVCE students scoring 3.2. These three groups also had the students with the lowest mean ages of the groups (see Table 24). In order to investigate whether age was a significant factor, further analysis was done using an independent samples t test. The pilot study had indicated a difference in student preferences for different types of course and teaching by age, so the students were grouped by age as 'under 21 years' and '21 plus years'. The mean values of these groups were compared using a t test, and this revealed highly significant differences between the groups for three of the statements (see Table 25). Scores for each statement were investigated by descriptive statistics (frequencies).

Table 25. Mean scores for student preferences for different types of course and teaching by age

Statement on ASSIST	Mean score all students N = 84	Age under 21 N = 63	Age 21 plus N = 21	P value
Ca	3.8	3.8	3.8	>0.1
Cb	4.0	4.0	4.1	>0.1
Cc	3.9	4.0	3.7	>0.1
Cd	3.7	3.6	3.9	>0.1
Ce	3.9	4.1	3.1	0.001
Cf	4.2	4.3	4.1	>0.1
Cg	3.2	3.0	3.6	0.036
Ch	3.4	3.3	3.9	0.010
Ci	4.2	4.2	4.2	>0.1

Statement Ce, 'exams or tests which need only the material provided in the lecture notes' showed a significant difference between the two groups with younger students scoring higher than mature students. This statement reflected a surface approach to learning.

Statement Cg, 'modules where we are encouraged to read around the subject' was liked more by mature students than younger students. Reading around the subject reflected a deep approach to learning rather than just covering the course material.

Statement Ch, 'learning materials that challenge me and provide deeper explanations' was scored higher by mature students than by younger students. This statement reflected a deep approach to learning, and was also found to score significantly higher for mature students in the pilot study.

These results add further weight to the findings that mature students have a preference for adopting a deeper approach to learning.

5.1.6 Investigation of students' expectations and motivation

A group discussion with three students who were coming to the end of their first year in 2003/04 in HE took place to gather information on their perceptions of the transition to HE (see Appendix (ii)). When asked about assessment methods and what differences they found compared to the way they were assessed in FE, students had found notable differences. One student stated: "The deadlines are more difficult [in HE]. In college we were more prompted and it [the assignment work] was broken into chunks" (Student with an AVCE qualification). This student also found that the large class sizes in HE had made it difficult to concentrate. When asked if induction/Welcome Week had been what they expected, all three students initially agreed that they had been able to remember little about it. When prompted on particular aspects of Welcome Week, they recalled having found only parts of it to be useful, they hadn't really got to know staff or other students and they had not found it to be any fun at all. All three had, however, been looking forward to studying in HE and still felt the same after induction week.

On being asked if the way they did their learning had changed in HE, there was a mixed response. A mature student with A levels reported having to change because of the tighter deadlines. The student with a qualification from an overseas institution had found the work much harder here, but better than in college. The student with an AVCE qualification stated: “not really, I take it in, remember it and spit it out for exams”.

On module guides, the students were asked which parts they read first and they were all agreed that the section on assignments and weightings was the first thing they read. They were asked which parts they did not bother to read and one stated: “all the rest”. The students expressed a lack of understanding of grades, elements and components in modules and wanted to know the difference. One mature student stated: “No [I don’t understand them], I wish I did. How do you work out a degree classification?”

They felt that their studying would be enhanced by more discussion and question and answer sessions and by having: “a fuller day, but less often”. They did, however, think that their lectures were well backed up by WOLF, the University’s on-line learning environment.

With regard to how well they had coped with the change to a HE learning environment, the students felt that they had coped, but it had taken a while. They thought it [the transition] could have been improved by having someone from HE going to talk to them whilst they were in FE about the work, the deadlines and the grade point system etc.

This meeting highlighted several areas where the student experience could have been better, but the small sample size meant that information had to be gained from a larger number of students to enhance the validity of the findings. A short list of open-ended questions (see Appendix (iii)) was drawn up and students were asked to complete these during a workshop session whilst waiting for their turn to demonstrate a practical assessment. This questionnaire asked students to identify the most difficult or stressful things about the change from attending school or college to studying in HE. It also asked what the university could have done to improve this and what could have been done in school or college to improve the transition. Questions were also included on the best and worst aspects of studying in HE and if the students themselves had any recommendations to make.

Forty-six completed questionnaires were collected and the data were coded into categories according to the issue and where this could be most appropriately addressed. The data from the group discussion were also added to this data where possible and a table was drawn up (see Appendix (iv)). Some of the factors, such as finances and the workload, that students indicated had been stressful were common to many HE institutions (see Chapter 2, Section 4). Other factors such as the first assignment and Welcome Week were less well known to staff as sources of difficulty or stress to students. It was interesting that many students requested early introductions to their personal tutors and 'ice breaker' activities as well as help with their first assignment and for more information to be available on-line. Students did indicate that they liked the on-line learning environment (WOLF), the relaxed atmosphere and supportive staff in SCIT and the Learning Centre.

From the above information, a second table was compiled (see Appendix (v)) that presented the initial findings in a form that appropriate to disseminate the findings to staff in SCIT. This indicated to staff where certain steps could be taken to prepare students for their first year in HE in terms of what could be done in schools or colleges prior to entry; additions to the existing postal package received by students; the Welcome Week activities; the personal tutor system and the Level 1 modules. This list was not definitive, but rather starting points from which some of the steps in the intervention programme could be planned.

Conclusions drawn from these findings were that students had not had realistic expectations of the teaching and learning environment found in HE, or of the level of support they would receive. It was also possible that HE staff were less aware of the nature of the previous educational régime encountered by current students owing to the increased diversity within the student body and changes to courses in FE. It was clear that students wanted to have more information at an early stage and, while this had been available, students were clearly vague about how to access this material or had not read the literature that had been available. Students clearly wanted a greater level of activity and involvement in Welcome Week and required more help with adjusting to their new environment.

The students who were interviewed appeared to be quite well motivated but it was not possible to draw conclusions on this as less well motivated students had probably not attended. Motivation was one of the student factors in the presage factors of Biggs' (1999) 3 P model. The literature (see Entwistle, 1998, Fazey and Fazey, 1998 and Jenkins, 2003) has shown that student motivation was affected by teaching and assessment and that student motivation decreased when expectations were not met. Winn (2002) found that the difficulties faced by staff in providing a learning environment to meet the wide range of student needs were compounded by the diversity of the students' experiences and the complexity of the relationship between students' lives and their academic work. It can be concluded from the data that students need to have realistic expectations of HE study and then have those expectations met, and that the needs of diverse students need to be fully explored and understood.

5.1.7 Conclusions

- The feeder institutions attended by students prior to their entry into HE were not found to have had any significant effects on a student's chances of progression through Level 1 on Computing and Computer Science courses.

- There was evidence to suggest that the entrance qualification gained by a student did affect student performance at Level 1. Students with an AVCE award had performed less well than those with A levels on most modules. The information gained from the results of the investigation of learning styles and strategies suggested that the nature of the teaching, learning and assessments used during that qualifying course may have been as influential in a student's progress as the actual knowledge, skills and understanding that the students achieved in school or FE.

- Mature students were found to score more highly on the deep approach scale than younger students. This finding was statistically highly significant; though not necessarily a predictor of success, as mature students have other factors to take into account (see Chapter 2, Section 4.).

- Students were also found to be unprepared for the teaching and learning environment they encountered in HE and required more support with the process of transition and adaptation to studying in HE. Support, in the form of more information for students and ensuring all students had access to that information, was essential. This information needed to be directed at students prior to entry, during Welcome Week and then through Level 1 in terms of workload and assignment planning and support.

5.1.8 Intervention

An intervention plan that sought to address the main findings of this research (detailed in Chapter 6) was devised to act in the following areas: -

- the information available to students on all aspects of the HE experience;
- the personal tutor system;
- the assessment régime;
- Welcome Week;
- teaching and learning.

5.2 Results and discussion phase two

The 2003/04 cohort was followed up during Level 2 and 53 students completed the ASSIST questionnaire during a break between lectures in a core module. The resulting data were investigated for patterns that may emerge between student achievement at Level 2 and the following factors:

- entrance qualification;
- approaches to learning;
- students' conceptions of learning;
- course and teaching preferences.

5.2.1 Investigation of entrance qualifications and achievement at Level 2

A wide range of modules was available at Level 2 which enabled students to embark on specialist routes. For the purposes of this study, eight modules were selected for statistical analysis as they had student numbers of 42 or more. Table 26 provides a summary of the results of regression analysis using dummy variables when student performance on eight modules was investigated in relation to the student's entrance qualification for the 2003/04 cohort at Level 2.

Table 26. Module results by entrance qualification

Module	N	Credits	Overall mean grade	Mean grade (excluding AVCE / A level)	A level	P value	AVCE	P value
CP2001	105	15	8.6	8.9	-0.45 (n=47)	>0.1	-0.03 (n=32)	>0.1
CP2020	47	15	10.3	9.4	+0.87 (n=15)	>0.1	+1.40 (n=20)	>0.1
CP2023	50	30	7.6	7.6	+1.40 (n=26)	>0.1	-2.60 (n=12)	>0.1
CP2080	45	30	9.3	9.4	-0.06 (n=15)	>0.1	-0.01 (n=18)	>0.1
CP2087	61	15	8.1	8.0	-0.06 (n=32)	>0.1	+0.77 (n=13)	>0.1
CP2089	59	15	8.6	8.5	+0.50 (n=31)	>0.1	-0.27 (n=13)	>0.1
CP2091	43	30	7.5	7.5	+1.00 (n=14)	>0.1	-0.44 (n=18)	>0.1
CP2236	47	15	10.8	9.6	+2.50 (n=16)	0.08	+0.72 (n=19)	>0.1

No significant differences were seen between the two groups in terms of module grade point across all eight modules. These results show that on four modules (CP2001, CP2020, CP2080 and CP2087) students with an AVCE award had performed marginally better than their counterparts with A levels. On the remaining four modules (CP2023, CP2089, CP2091 and CP2236) those students with A levels had shown the better performance of the two groups. Students with A levels had performed better than students with ‘other’ qualifications on six modules. Students with an AVCE had performed better than students with ‘other’ qualifications on three modules. It was notable that the differences in performance between the groups of students had diminished greatly from Level 1 to Level 2.

5.2.2 Investigation of the approaches to learning adopted by students.

Factor analysis of the 52 question ASSIST questionnaire (see Appendix (i)) was undertaken for the 2003/04 cohort in Level 2 (see Table 27).

Table 27. Factor analysis of the 52 item ASSIST questionnaire for 2003/04 cohort (Level 2)

(N = 53)	Factor			
	1	2	3	α
Deep approach				.80
Seeking meaning		.66		.52
Relating ideas		.80		.65
Use of evidence		.84		.67
Interest in ideas		.82		.78
Strategic approach				.80
Organised studying	.79			.44
Time management	.75			.70
Alertness to assessment demands	.78			.57
Achieving	.62			.30
Monitoring effectiveness	.72			.45
Surface apathetic approach				.64
Lack of purpose			.54	.75
Unrelated memorising			.88	.64
Syllabus boundness			.43	.59
Fear of failure			.86	.60

Chronbach's alpha (α) was used to determine the internal reliability of the three main scales and the thirteen sub-scales. Where this value was considered low (<0.6) the data were investigated for multidimensionality.

Seeking meaning (α = .52) was found to have two components with statement B6 seen as a separate component to the other three statements (B17, B30 and B43). When B4 was removed from the reliability analysis, the α score for the remaining three statements rose to .58. Factor loadings were (component 1) B17 (.79), B30 (.71) and B43 (.72) and for component 2, B4 (.91).

Seeking meaning comprised the following statements: -

B4. *I usually set out to understand for myself the meaning of what we have to learn.*

B17. *When I'm reading an article or book, I try to find out for myself what the author means.*

B30. *When I'm reading I stop from time to time to reflect on what I'm trying to learn from it.*

B43. *Before tackling a problem or assignment, I first try to find out what lies behind it.*

Further analysis of these statements by frequency showed that 77.4% of students responded to statement B4 with a 4 or a 5 (4 meaning I agree and 5 meaning I strongly agree). For statement B17, 41.5% responded with a 4 or a 5, and for statements B30 and B43, the percentages were 43.4 and 47.2 respectively.

Organised studying ($\alpha = .44$) was found to have two components. B14 and B27 were component 1 and B1 and B40 were component 2. Organised studying comprised the following statements: -

B1. *I manage to find conditions for studying which allow me to get on with my work easily.*

B14. *I think I'm quite systematic and organised when it comes to revising for exams.*

B27. *I'm good at following up some of the reading suggested by lecturers or tutors.*

B40. *I usually plan out my week's work in advance, either on paper or in my head.*

Factor loadings were B1 (.88), B14 (.82), B27 (.68) and B40 (.62). When reliability analysis was performed for the two separate components, the scores were lower with component 1 having an α score of .39 and for component 2 α was .38. This indicated that the inter-item correlation was low and the data were not unidimensional.

Alertness to assessment demands (α = .57) was found to have one component with B2 and B15 having a weaker association than B28 and B41. Alertness to assessment demands comprised the following statements: -

B2. *When I'm working on an assignment, I'm keeping in mind how best to impress the marker.*

B15. *I look carefully at tutor's comments on course work to see how to get higher marks next time.*

B28. *I keep in mind who is going to mark an assignment and what they are likely to be looking for.*

B41. *I keep an eye open for what lecturers seem to think is important and concentrate on that.*

Factor loadings were B2 (.50), B15 (.59), B28 (.78) and B41 (.75).

Achieving (α = .30) was found to have two components with B24 seen as a separate component to the remaining 3 factors (B10, B37 and B50). The α value increased to .51 when B24 was removed from the reliability analysis. This indicated that students had responded in a different way to statement B24 than they had to the other three statements (B10, B37 and B50). This finding was also noted with this cohort in Level 1.

Achieving comprised the following statements: -

B10. *Its important for me to feel that I'm doing as well as I really can on the courses here.*

B24. *I feel that I'm getting on well, and this helps me to out more effort into the work.*

B37. *I put a lot of effort into studying because I'm determined to do well.*

B50. *I don't find it at all difficult to motivate myself.*

Factor loadings for component 1 were B10 (.80), B37 (.79) and B50 (.45) with component 2, B24 (.86). For component 1, the weak association of B50 with the remaining two factors (B37 and B50) accounted for the relatively low α score of .51. Further investigation of B24 by means of frequencies showed that students had responded to B24 (70% scoring 4 or 5) in a similar way to that of B10 and B37 (83% and 66% scoring 4 or 5 respectively). For statement B50, 42% of students had responded in this way. Analysis of B24 using ANOVA in order to investigate for differences between groups showed no significant differences for age, but did show that students with A levels were significantly different (p = 0.018) to other groups when entrance qualification was input as the independent variable. In this instance, entrance qualification had been defined as three groups, A levels, AVCE and Other (see Table 28).

Table 28. Result of ANOVA for statement B24 by entrance qualification (three groups)

	Mean score all students (N = 53)	**A level N = 18**	**AVCE N = 12**	**Other N = 10**
	3.9	4.5	3.5	3.9
P value		0.018	>0.1	>0.1

Table 28 shows that students with A levels had scored significantly higher than both students with an AVCE and other entrance qualifications, though reasons for this were not clear. When B10, B37 and B50 were analysed by ANOVA for differences between the groups by age or entrance qualification, no significant differences were found.

Monitoring effectiveness ($\alpha = .45$) was found to have 1 component with B7 and B20 having a weaker association than B34 and b47. Monitoring effectiveness comprised the following statements: -

B7. *I go over the work I've done carefully to check the reasoning and that it makes sense.*

B20. *I think about what I want to get out of this course to keep my studying well focused.*

B34. *Before starting work on an assignment or exam question, I think first how best to tackle it.*

B47. *When I have finished a piece of work, I check it through to see if it really meets the requirements.*

Factor loadings were B7 (.26), B20 (.49), B34 (.76) and B47 (.85).

Syllabus boundness ($\alpha = .59$) was found to have two components with component 1 comprising B12 and B25 and component 2 comprising B38 and B51. Syllabus boundness comprised the following statements: -

B12. *I tend to read very little beyond what is actually required to pass.*

B25. *I concentrate on learning just those bits of information I have to know to pass.*

B38. *I gear my studying closely to just what seems to be required to pass.*

B51. *I like to be told precisely what to do in essays or other assignments.*

Factor loadings were B12 (.92), B25 (.83), B38 (.82) and B51 (.78). When reliability analysis was performed on each component, the α value for component 1 was .72 and the α value for component 2 was .49. This indicated that the correlation between the items in component 2 were lower than the correlation for items in component 1.

Using dummy variables, regression analysis of approaches to learning in relation to entrance qualification was undertaken. No significant differences were found between the groups.

The effects of approaches to learning in relation to module grades were investigated by regression analysis. No significant differences were found between a student's approach to learning and the module grade point achieved.

Module grade points were investigated by entrance qualification (three groups) using ANOVA and one module, CP2023 showed a significant difference ($p = 0.024$) between the groups. Bonferroni *post hoc* tests were employed to investigate the differences between the groups in more detail (see Table 29).

Table 29. *Post hoc* tests results of comparison between entrance qualification and grade point score on module CP2023

	Number	**Compared to A level**	**Compared to AVCE**	**Compared to Other**
A level	26		+4.0 (p = 0.02)	+1.4 (>0.1)
AVCE	12	-4.0 (p = 0.02)		-2.6 (>0.1)
Other	11	-1.4 (>0.1)	+2.6 (>0.1)	
Total	49			

These results showed that students with an AVCE scored lower than other students, and significantly lower than students with A levels on this module. The reasons for this were unclear.

An investigation for relationships between age and approaches to learning was undertaken using an independent samples t test (see Table 30). No statistically significant differences were found between the groups, but mature students (21 years plus) scored higher on the deep approach scale, as they had in the same investigation in Level 1 (see Chapter 5, Section 1. 3).

Table 30. Results of approaches to learning vs. age

Age of student	**Number**	**Deep approach Mean score**	**Strategic approach Mean score**	**Surface approach Mean score**
Under 21	36	54	70	51
21 plus	17	59	72	50
P value		P = 0.06	>0.1	>0.1

Regression analysis of deep approach to learning by age produced a result that was close to significance (P = 0.06). These findings are similar to those of the pilot study and of this cohort at Level 1, which showed that older students scored higher on the deep approach scale.

5.2.3 Investigation of student conceptions of learning

The first six statements on the ASSIST questionnaire concerned student conceptions of learning. Data were obtained on this aspect via Likert type responses to the statements. Comparing the mean values between the students, grouped by entrance qualification using ANOVA, there were no significant differences in students' conceptions of learning in relation to the student's entrance qualification.

As the pilot study had indicated a difference in student conceptions of learning by age, the students were grouped by age as 'under 21 years' and '21 plus years'. The mean values of these groups were compared using an independent samples t test and this revealed no significant differences between the groups in student conceptions of learning.

5.2.4 Investigation of students' preferences for different types of course and teaching

Preferences for different types of course and teaching were the subject of the last nine statements on the ASSIST questionnaire. As they had in the previous year, Students were required to indicate their preferences on a Likert type scale, where 5 meant "I definitely like" and 1 meant "I definitely dislike". The groups, by entrance qualification, were analysed by ANOVA in order to determine if there were differences in the mean scores between the groups. The data were firstly combined into 3 groups; A levels, AVCE and Other as some entrance qualifications within the 'Other' group had fewer than three students. No significant differences were found between the groups for this analysis.

The same nine statements on ASSIST were analysed using an independent samples t test with the data grouped by age into two groups, 'under 21' and ;21 plus' (see Table 31).

Table 31. Results of one way ANOVA of students' preferences for different types of course and teaching by maturity

ASSIST statement (N = 53)	**P value**
(Ca) Lecturers who tell us exactly what to write down in our notes	>0.1
(Cb) Lecturers who encourage us to think for ourselves	>0.1
(Cc) Lecturers who show us how they think for themselves	>0.1
(Cd) Exams which allow me to show that I have thought about the course material	>0.1
(Ce) Exams or tests which need only the material provided in the lecture notes	0.028
(Cf) Modules in which it is made very clear which learning materials we have to use	>0.1
(Cg) Modules where we are encouraged to read around the subject	>0.1
(Ch) Learning material that challenge me and provide deeper explanations	>0.1
(Ci) Learning materials giving me straightforward information	>0.1

With the exception of one statement, no significant differences were found. Statement Ce did show a highly significant difference between the groups and this was investigated further using descriptive statistics for group means and frequencies. The result showed that younger students scored higher for this statement than their older counterparts (see Table 32).

Table 32. Mean scores for student preferences for different types of course and teaching by age

Statement on ASSIST	**Mean score all students N = 53**	**Age under 21 N = 36**	**Age 21 plus N = 17**	**P value**
Ce	4.1	4.3	3.7	0.028

Statement Ce, 'exams or tests which need only the material provided in the lecture notes' reflected a surface approach to learning. This result with younger students scoring higher than older students has shown consistency through the pilot study, the 2003/04 cohort at Level 1 and again at Level 2.

5.2.5 Conclusions for phase two

- The difference between students in terms of performance on modules in relation to their entrance qualification had greatly diminished from Level 1 to Level 2 (see Chapter 5, Section 2.1). This finding may have been the result of many factors that interact at the process level of Biggs' (1999) 3 P model.

    1. The broad nature of Level 1 in HE that was designed to prepare students for Level 2.
    2. Students began to study specialist routes at Level 2 which may have been more interesting and more motivating for some students.
    3. The students' experiences at Level 1 became part of the student factors in the presage factors for Level 2 and will have been influential in their learning focused activities in the process level of Biggs' (1999) 3 P model.
    4. Students entered Level 2 with experience of the teaching context in HE, so were likely to be familiar with teaching methods, assessments and other procedures that they encountered at Level 2.

- No significant differences were seen between approaches to learning and entrance qualification (see Chapter 5, Section 2.2). Where a difference was seen between student approaches to learning and age, mature students scored higher on the deep approach scale, and lower on the surface approach scale (see Chapter 5, Section 2.2).

- No significant differences were found for student conceptions of learning between the groups by entrance qualification (see Chapter 5, Section 2.3). Only one significant difference was found when analysis was performed by age, with older students scoring significantly lower than those ‘under 21’ for a statement that reflected a surface approach to learning (see Chapter 5, Section 2.4). This concurred with the findings of the pilot study and those of the 2003/04 cohort at Level 1.

6. The Intervention Program

6.1 Introduction

From the results discussed in Chapter 5, intervention was planned to target the following areas: -

- to improve the quality and the mode of delivery of the information given to students prior to entry, on admission and during their first year;
- to improve the personal tutor system, and to improve the support and guidance given to personal tutors;
- to set up a project that enabled staff in both FE and HE to have a greater understanding of the nature of assessment régimes in FE and at Level 1 in HE;
- to develop a 'hands-on' activity for students in Welcome Week that served to introduce them to the University and school facilities, the teaching staff, the support mechanisms, the learning environment and their peers;
- to provide staff with information on student performance on modules. This information would enable staff to devise and implement changes to bring about improvements in student performance.

The steps taken are detailed in the flow chart that follows (see Figure 12).

Figure 12. Flow chart to show steps taken in phase two of this research

Key. **Information available to students** (green)
The personal tutor system (yellow)
The assessment regime (red)
Welcome week activity (purple)
Teaching and learning (blue)

6.2 Information availability for students

Students received a considerable amount of paper-based information in a Welcome Pack sent out by admissions staff prior to entry. They also received information verbally, often backed up by leaflets, during talks in Welcome Week. This was reinforced by regularly updated notice boards around the building and well-informed staff in the school office. There was also a considerable amount of information available on-line via the University's home page. One of the intended outcomes of Welcome Week was that students should become familiar with the support services, as well as the university and school facilities, the staff and other university services.

The need for practical help and support especially for students in a diverse group was seen by Gould and Harvey (1999) and Allen (2001) (see Chapter 2, Section 9), though it was clear, from the results of the group discussion and the open-ended questionnaire (see Chapter 5), that students were not making full use of the information that was available. Several possible reasons were considered for this: -

- students, who failed to realise its importance, often skimmed through paper-based information quickly. Information on paper was easily mislaid and often appeared lengthy and boring to students who were keen to embark on their undergraduate courses;

- students, who may have been anxious about starting on their undergraduate program of study, may have perceived there to be an element of information overload during Welcome Week;

- the University's website is extremely comprehensive, containing a vast amount of information relating to all aspects of university life. It may, therefore, have been difficult for new students to navigate around the site to access particular information.

The information received by students in their Welcome Pack was generally prescribed by the admissions team. There was little room to include other information, but an academic calendar was included. Although this was available on the University's website, not all pre-entry students had facilities to access this material or to print a copy. Some students needed this information prior to admission in order to arrange childcare or work patterns, as the academic calendar does not always coincide with school calendars or employment breaks.

A discussion was held with members of staff who were involved with first-year students and it was concluded that a website was the method of choice to convey important information to new students. This decision took account of the fact that these were computing students and would probably be more inclined to access information in this format. There was, however, thought to be a need to keep the information to short paragraphs or bullet points, as students were clearly averse to reading pages of information. The information needed to target the specific points raised by students and to give clear guidelines as briefly as possible. The format needed to be bright and cheerful, keeping away from the academic or authoritative tone that may be off-putting to new students, most of whom were teenagers straight from school or college. A website that specifically addressed the needs of students new to HE and SCIT did not exist prior to the commencement of this research project.

The content was selected by the researcher with assistance from teaching staff and the website itself was designed by a third year student for his undergraduate project.

There were nine issues that could be addressed by means of a 'New Students' Website':

1. help students to find their way around the city, campus and building;
2. show students where to get academic help and support;
3. help students to identify members of staff;
4. show students where to get everyday items;
5. describe the role of a personal tutor;
6. explain the grade point system; explain components and elements;
7. explain the importance of deadlines for assignments;
8. provide information on modules;
9. explain the procedures for dealing with illness and other problems.

1. The link for directions was **"How do I find my way around?"**

   This link led to a page of 13 links, which included maps of all the University's campuses. These links also included regional maps, road and air maps, travel guides, travel links and other useful contacts and web addresses, such as campus travel, accommodation services, student life, equal opportunities, an international section and many more. Students had specifically requested maps and travel information.

2. The academic support link was **"Where can I get help with maths, or communications or study skills?"**

This linked to a page that detailed the dates and times of Numeracy and Maths Support; Communications and English Support; International Students Support and Programming Support sessions that were held in the SCIT. Links were also included to other sources of help, and contact details for appropriate members of staff.

3. **"How will I know who is who?"** was the link to provide students with information about the staff in SCIT. This linked to a page with the names, roles and e-mail addresses of the seven members of staff who were award or pathway leaders. A second link went to a comprehensive list of all the members of staff in SCIT including research and administration staff. Each name linked to a page with the full e-mail address, the telephone number, room number, facsimile number and full University postal address of that member of staff.

4. For information on obtaining everyday items, the link was **"Where can I get books/food?"** This detailed all the University's catering facilities and their locations and provided a lot of information about the range of literature, other media and facilities available in the University's learning centre including items available for purchase.

5. **“What is a personal tutor?”** was the link for information about personal tutors. The page explained the role of a personal tutor, the frequency of meetings with students and gave the location where the list of personal tutors was displayed.

6. Grade points and components had been an area that many students had been unsure of. This link **“What are grade points and components?”** took the site visitor to a page that explained how the student should study the module guide to see how each module was made up of components and elements, and how these reflected the level of performance required in order to pass the module. Also included on this page was a table showing the grade point scale, the level of performance that grade indicated, and how that related to a degree classification.

7. **“What happens if I miss a deadline?”** was the link to a page containing information on deadlines and a link to a page on mitigation, money matters and components within modules. The page on mitigation explained to students the importance of contacting their personal tutor and detailed the rules on extensions and obtaining medical certification for ill health.

8. Comprehensive information about modules was via the link **“Tell me about modules please.”** This link explained about core modules, core option modules and elective modules. There were links to components and elements, and a comprehensive list of HND modules and Level 1 degree modules. There was also information about the number of credits required and how to obtain these.

9. Information about illness and other problems faced by students was on the page linked to by **"What happens if I am ill or have personal or financial problems?"** This linked to the page on mitigation and detailed the mechanisms by which students may apply for mitigating circumstances, including details of the correct form to request from Registry. It was thought to be important that both pages seven and nine linked to the information on mitigation and money matters to ensure that students who accessed either page had this information available.

Considerable input for the contents of the website was obtained from members of staff who were involved with admissions, Welcome Week and Level 1 students. It was made available through the University's virtual learning environment (WOLF) via the SCIT Students' link. The pilot running of the web site was with the 2004/05 cohort. Poster notices, informing students of this new website and its address, were placed on notice boards and beside the school office.

A page of open-ended questions about the website was drawn up in order to obtain feedback during semester 2 from the 2004/05 Level 1 cohort. Students were requested to complete these short questionnaires during a computer workshop and 103 responses were obtained. The questions were as follows: -

1. *Were there any more topics that should have been included on the site?*
2. *Was there anything on the site that need not have been included?*
3. *Was the site easy to use?*
4. *Was the information easy to understand?*
5. *How would you improve the site?*
6. *Any other comments?*

For question 1 (*Were there any more topics that should have been included on the site?*), four students requested a shuttle bus timetable; three students wanted the exam timetable; two students requested guidelines on how to use WOLF; four students requested information on how to change modules or course; four students asked for staff contact details; two students wanted a plan of the building; one requested details of social events; two asked for information on accommodation; one asked for information on programming surgery sessions; one wanted information on how much time to spend on each module; one asked for information on how to calculate their grade; one wanted an area for part-time students and two asked for details of how to make a complaint.

An overwhelming 'no' (N > 90) was the response to question 2 (*Was there anything on the site that need not have been included?*). Indicating that all the areas included on the site were of use to students. One student commented, "it was all relevant". The remainder left the question blank.

Question 3 (*Was the site easy to use?)* was met with a resounding 'yes' (N > 90). "Yes, very easy and user friendly" was the comment by one student, and another stated: "clear, fun design, very easy to use".

Question 4 (*Was the information easy to understand?)* was a general yes (N > 80). Comments were received from one student: "to the point and helpful". Another student responded: "yes, and not too much information". Several students responded: "yes, very clear and easy".

Question 5 (*How would you improve the site?*) received mixed responses. Several students had not previously accessed the web site and asked if it could be made into a default page for students. Three students requested a questions page. 32 students said it could not be improved. 41 students wanted improved graphics and 20 requested uniform fonts on the home page.

Question 6 (*Any other comments?*) was largely left blank except for six students who wanted the website to be easier to find and they wished they had found it earlier. One student commented: "I'm happy now I know the site exists, pity I wasn't aware of it nine months ago".

6.2.1 Reflection and evaluation

Students from non-traditional backgrounds have greater support and teaching needs, especially in the first year in HE according to Allen (2001). Similarly, Bamber and Tett (2000) reported that non-traditional students required the type of support that was more teacher-intensive than traditional students, while Connor *et al*. (2001) found that students who were least satisfied with their experience in HE were those who felt ill informed about HE on entry (see Chapter 2, Section 9). The high staff: student ratios found in present day HE institutions means that it is not possible for students to receive information in small groups that are more prevalent in sixth form and FE. Paper based information was, to a great extent, ignored or passed over by students who clearly needed to interact with information in a more personal way. This might apply to students in general, or more particularly to students on Computing or Computer Science courses who may have a preference for accessing information on line.

The introduction of the 'New Students' Website' was clearly seen by most students as a useful tool for accessing the information they needed at the start of their undergraduate program and during their first year of study. It was also clear that there had been problems in raising students' awareness of the website, as not all the students had been familiar with navigating around the WOLF virtual learning environment and accessing appropriate pages. Students had been given practical sessions during Welcome Week which included using WOLF, but this had clearly not been sufficient as many students had not accessed the website. The vulnerability of students at the start of their courses was seen by counsellors and advisors as a reason to improve the provision of support in the first year according to Earwaker, (1992) (see Chapter 2, Section 4). Some students may have enrolled late or missed the sessions on WOLF and needed more guidance. Earwaker, 1992; Wisker and Brown, 1996 and Moxley *et al*., 2004 all advocated that early identification and provision of support were key factors in retention (see Chapter 2, Section 9). The provision of practical help during induction week was considered by Allen (2001) to be of great importance, especially to non-traditional students and those living off campus (see Chapter 2, Section 9), so it was essential that ways were developed that facilitated student interaction with the material on the website.

It was decided that students needed to undertake an activity in Welcome Week that involved them accessing the 'New Students Website' and engaging with the information provided there. Simply accessing the website did not necessarily involve the student in more than simply being able to access the information. It did not involve the student in activities that caused them to analyse, make comparisons or explain the topics on the website. These activities require a certain level of engagement with the material which was more likely to achieve one outcome of Welcome Week, namely that students became familiar with support services and other university facilities and services. In order to promote student engagement with this material it was necessary to develop a means of getting students to undertake appropriate learning related activities. Biggs (1999) referred to level 3 teaching which focuses on what the student does and stated: "Its not what *we* do, its what *students* do that is the important thing" (Biggs, 1999, p. 24). It was thought that getting student to undertake a learning related activity with this material could be achieved by using the website as a component of the 'Welcome Week Challenge' that is described fully in Chapter 6, Section 5.

6.3 The personal tutor system

6.3.1 Changes to the system

For the 2002/03 cohort, personal tutors kept their group of 25 tutees until the end of the student's second year, including any period for which the student went part-time. The tutor would therefore have a mixture of tutees, full-time, part-time, year 1 and year 2. This was found to be impractical especially around Welcome Week time when each group had a different starting time. Connor *et al*. (2001) reported that there was a need to improve the personal support from tutors, and to ensure from the outset that students understood the level of support they could expect from tutors (see Chapter 2, Section 9). It was thought that improvements could be made by keeping tutors to a particular year, therefore becoming experienced in all aspects of a particular year. Most institutions had recently re-introduced or revised their personal tutor systems according to Yorke and Thomas (2003) who also stated: "The role of the personal tutor was being recognised as needing revision from the past (where it was in any case often a token activity" (Yorke and Thomas, 2003, p. 70).

For the 2003/04 cohort tutors changed from the 2002/03 system to looking after students from the same cohort. As there were fewer first year tutors for this academic year, new tutors had 40 tutees and experienced tutors generally had 50 tutees. Although this could be considered quite a large number for any personal tutor, Earwaker (1992) reported an instance where a number of staff were each trying to serve as the first person a student turned to, for more than 100 students (see Chapter 2, Section 9). A year 1 tutor remained as a year 1 tutor while the students moved on to one of the designated year 2 tutors. This applied to the large awards, but smaller awards may have had just one tutor for all years where student numbers were small. It was also decided to have designated tutors who would deal only with part-time students. Rivis (1996) (see Chapter 2, Section 9) reported that the increase in the number of students in HE had put personal tutor systems in many institutions under great strain. SCIT increased the amount of personal tutor training sessions for the 2005/06 academic year, largely at the request of personal tutors. Working with non-traditional students is a teacher-intensive business according to Bamber and Tett (2000) who also stated: "The requirement is significantly greater in terms of face-to-face contact with individual students, marking, personal tutoring and coaching" (Bamber and Tett, 2000, p. 74).

The 2002/03 cohort enrolled for their courses at a set time during Welcome Week, at which tutors were expected to attend in order to deal with any queries that arose. On-line enrolment was introduced for the 2003/04 cohort and students were expected to enrol on-line in their own time, preferably before they attended Welcome Week. This made enrolment far more efficient and brought an end to the lengthy queues previously found when a largely paper-based system existed. Checking that students had enrolled on the correct courses could now be done when tutors met their new tutees in Welcome Week.

After Welcome Week for the Level 1 cohort, making contact with students was largely done using e-mail and WOLF. The move to the new building in September 2005 meant that staff could no longer pin notices to their office doors, and notice boards were not immediately available. Personal tutor surgery times were published on WOLF rather than pinned to the tutor's door. One senior member of staff commented: "this works quite well as students are generally good at responding to e-mails and are becoming more aware of the facilities offered via WOLF".

6.3.2 Supporting personal tutors

Earwaker (1992) noted that institutions employed professionally trained counsellors and advisors, but that the personal tutor was often the first person a student turned to for advice. It was important therefore that personal tutors clearly understood their role in the support process. Earwaker (1992) also saw a need for improved 'back up' for tutors in the form of written guidelines for all staff on how to operate in a student support role, and for information on the institutional support that was available to students (see Chapter 2, Section 9).

As the personal tutoring role was always undertaken in combination with other roles such as lecturing and module leadership, tutors generally had little time available to investigate changes to the help and support that was available to students. Help and support was also available from sources such as the Students' Union and the Learning Centre, which may have been less well known to staff. It was thought that personal tutors might benefit from a booklet that detailed the availability of support across the institution on several key areas that were known to pose problems for students, e.g. academic difficulties, financial worries, housing and personal problems (see Chapter 2, Section 4).

Literature on sources of help and support for students was collected from key areas across the institution, namely: -

- SCIT
- the Learning Centre
- the Students' Union
- the Higher Education Shop
- the Student Services Gateway
- the University's website

Each source had a range of information available, with a considerable amount of overlap. The information was grouped by theme, and the following themes emerged:-

- financial support
- housing
- personal problems
- miscellaneous
- academic support

These themes were developed into sections of a booklet for tutors (see Appendix (vi)), where each section numbered and summarised the information available and presented it in short paragraphs with web links and contact details. It was hoped that this would save valuable tutor time and effort by giving tutors access to all the relevant information on a topic without having to collect and read all the titles themselves, some of which were quite lengthy. The numbered leaflets from which the information was obtained were placed in a pack in the SCIT office where personal tutors could access them as and when necessary.

All aspects of financial support were covered by 11 different leaflets. These ranged from information on student loans, childcare grants, disabled students' allowances, to excellence scholarships and tax credits.

Housing problems were addressed in three leaflets that were available from three different sources, namely the Students' Union, the student Services Gateway and the Higher Education Shop. The leaflets dealt with rights and responsibilities of tenants, tenancy agreements and housing benefit.

Personal problems, and how to get help with them, were covered by five leaflets, of which one was a guide for staff who were supporting students through personal problems. The information generally outlined the support available from the Students' Union and the Student Services Gateway and how to access this support.

The miscellaneous section covered social and domestic areas on which students might require advice. These included safety in the home, alcohol, drugs and theft. Also included was information on permits and visas for international students and careers advice. These leaflets were mainly available from the Students' Union.

The academic support section was covered by sources of advice from the Students' Union and the Learning Centre. The University's website offered guides to study skills, referencing and other Learning Centre help, including study skills advisors.

The next section of the booklet comprised the timetables of the relevant workshop sessions put on by the Student Services Gateway, SCIT and the Students' Union with relevant web addresses and contact details. Useful University telephone numbers made up the last part of this section.

The 13-page booklets were delivered to all members of SCIT staff who were year, course and personal tutors for the academic year 2004/05.

6.3.3 Reflection and evaluation

Changes could not be made for research purposes to the number of students enrolling on courses in SCIT or to the number of staff available to become personal tutors. The fact that the increase in personal tutor training sessions was due to staff demand indicated a high level of commitment to the role. Staff were able to deal with a considerable number of tutees helped by the use of WOLF as communication tool and message board. Earwaker (1992) found that as well as needing information and training, these [personal tutor] staff were themselves in need of support and stated: "They were acutely aware of the tensions and ambiguities in their roles, struggling to do justice to tasks which they felt often pulled them in different directions" (Earwaker, 1992, p. 50). Increasing the interaction of staff with their tutees as part of the Welcome Week Challenge should help relationships to form between tutors and tutees at the earliest opportunity which reflects the findings of Earwaker (1992), who reported that tutors supported students most effectively by relating to the student personally.

When requesting feedback on the booklet produced to assist personal tutors in their support of students, only two members of staff were able to provide any. These two had found particular sections of the booklet extremely helpful. The remainder of the staff had mislaid their booklet but stated that they would have used it if they could locate their copy. Clearly the information was useful, but had not been presented in a format that suited the requirements of SCIT staff. According to Earwaker (1992), sources of back-up and support should be clearly identified.

After some discussion with members of staff it was thought that an electronic version of the booklet, made available via the desktop of staff personal computers, would be the method of choice for making the information available to staff. This was undertaken by the member of administrative staff responsible for student support who updated the information and created an on-line version of the booklet for the 2005/06 Level 1 academic year. Early feedback from staff has been positive.

6.4 The Assessment Project

Assessment had been found to be a factor that could affect a student's achievement at Level 1 in HE (see Chapter 5, Section 1.1). In order to make changes to the assessment régimes used at Level 1 in HE it was considered important to gain an understanding of the styles and content of the assessment régimes that students were used to receiving at their FE colleges (see page 123). Biggs' (1999) 3 P model shows that assessment is a factor in the teaching context of the presage factors in that model, while Prosser and Trigwell (1999) added previous experiences to the student factors of the 3 P model. These factors interact at the process level of Biggs' (1999) 3 P model to determine the student's learning-related activities which, in turn, determine the outcome (see Chapter 2, Section 2). Boud (1995) has shown that a student's response to assessment was not solely a response to the assessment tasks set, but of all the experiences of assessment that student has had previously (see Chapter 2, Section 7). Taking account of the assessment practices in FE should, therefore, enable staff in HE to develop assessment that is more relevant to their diverse range of students which should lead to improvements in its effectiveness and to the quality of student learning. It was evident from the literature (see Cook and Leckey,1999; MacDonald and Stratta, 2001 and Marks, 2000) that changes to students presage factors brought about by increasing diversity would be better addressed by appropriate changes to the teaching context, including assessment, rather than by expecting the students to change (see Chapter 2, Section 4).

Ten members of staff at four local FE colleges were asked for their opinions on assessment by means of an on-line questionnaire (see Appendix (vii)). These FE tutors were selected as they regularly took part in the SCIT-FE Liaison Committee meetings and taught on computing courses in their respective colleges. The questionnaire was designed to obtain information on the following areas: -

- the assessment methods that were being used formatively and summatively, both individually and in group work;
- the timescales and sizes of assessments;
- the level of support students received with their assignments;

- the deadline policies that were in place;
- the coursework resubmission policies;
- to what extent there were problems with plagiarism, collusion and/or cheating;
- how well tutors in FE thought that their assessment strategies prepared students for HE.

The results of this survey indicated that formative assessment was used twice as often in FE as summative assessment (67% and 33% respectively) (see Table 33) with portfolios being used the most in formative assessment methods and assignments being used the most in summative assessment methods.

Table 33. Result of questionnaire on assessment methods used in FE

Assessment method	**Used formatively**	**Used summatively**	**Count**	**Percent**
Exam: seen	0	0	0	0
Exam: unseen open book	0	0	0	0
Exam: unseen closed book	3	1	4	9.5
Exam: other	0	0	0	0
Multiple-choice tests	2	0	2	4.8
Short answer tests	3	1	4	9.5
Computer-based assessments	3	2	5	11.9
Logs/diaries	2	0	2	4.8
Portfolios	4	3	7	16.7
Assignments	3	4	7	16.7
Oral presentations to group	3	1	4	9.5
Oral presentations to staff	3	1	4	9.5
Other	2	1	3	7.1
Count total	28	14	42	
Percentage	67	33		
Respondents	6	6		

The ratio between formative and summative assessment was unexpected by staff in SCIT and it was considered that either; staff in HE were unaware of the high level of formative assessment students received in FE, or the FE tutors who had participated in the survey had different interpretations of the terms ‘formative’ and ‘summative’ to their counterparts in HE.

A wide range of assessment methods was used which included short answer tests and oral presentations. Larger tasks were used more often than weekly tasks in most cases (in a ratio of 5:2) for individual assignments. It had been thought by SCIT tutors that students who struggled with large tasks in HE had not been used to large tasks in FE and that students lacked experience with planning and time management. How these tasks were managed in FE, and the level to which students were required to work independently, were issues that needed to be explored further in future studies.

With regard to support, students received varying levels of support in FE. One FE teacher explained that a student’s level of support determined the grade they achieved at AVCE as the criteria were based on independent study and learning, so if a student received help it was on the understanding that they could only achieve a D or E grade. Another FE tutor commented that students received support with assignments in tutorials and assignment workshops.

A mixed response was found to the assessment policy deadline with two respondents reporting that late work attracted a fixed penalty. One FE tutor reported that they were unable to alter grades due to late hand-ins owing to BTEC regulations, which gave little incentive for students to hand in work on time. Another tutor found that policy on late submission needed to be updated as little existed and stated: “students do not seem to be any slower in producing work than they were when there was a strict policy”. The coursework resubmission policy varied somewhat with one FE tutor reporting that it was up to the individual teachers to decide how this was done. Another FE tutor commented that students were allowed to resubmit minor errors in order to get a pass grade though major errors or omissions were referred and resit assignments were issued at the end of the academic year.

Plagiarism, collusion and cheating were dealt with in several ways. In one instance assignments were based around students having to pick specific examples, so collusion was made difficult. Plagiarism had been reduced almost to zero on one FE course by stressing to students that staff authenticated scripts, and students would lose the 20% coursework grade on any scripts that were 'pulled'. Disciplinary action may be taken but generally students were required to resubmit work or undertake a new assignment if caught.

These findings were used as the basis for a one-day liaison seminar, which included two focus group discussions with groups consisting of a mixture of staff from FE and HE. The first discussion session focussed on "The Language of Assessment", which had been identified as a problem area during the initial survey. The second session concentrated on "Assessment Review" in which participants were able to compare a range of assessment material from FE and Level 1 of the Computing Degree Scheme in HE in order to raise awareness of the differences and similarities between them.

6.4.1 The outcome of focus group discussions

Assessment criteria in FE were found to be highly prescribed, on occasions running to three pages of bullet points. Policy regarding when coursework should be undertaken varied depending on the particular FE institution: some required that coursework was done during tutor-supported sessions while others allowed coursework to be done outside class sessions.

Predefined milestones were used in FE to help students to manage time and this was found to break large tasks down effectively into more frequent smaller tasks and aid planning. It was also found that FE students were able to resubmit large tasks on several occasions and feedback was given prior to the final hand-in for summative assessment. This was very different to practice in HE, where formative assessment was used separately and feedback was generally given only after the summative assessment.

It was also found that there was close personal contact between tutors and students in FE, which was thought to be helpful in keeping cheating under control. Students frequently worked in groups of 16 to 20 and they had contact with the same tutor around three times per week across several modules. The module guides used in HE were thought to be daunting and appeared to be written in order to satisfy quality assurance procedures rather than to help the student.

A considerable debate ensued with regard to the terminology used in assessments and assignments and how this was interpreted. The expected responses to words such as ‘explain’, ‘describe’ and ‘discuss’ differed greatly between the sectors. A typical assessment in FE had a space of three lines for a student to respond to a ‘discuss’ question whereas in HE a similarly worded question would be likely to require a substantial piece of work.

6.4.2 Reflection and evaluation

Considerable awareness was raised on the nature of the differences between assessment in FE and that in Level 1 in HE during the Assessment Project undertaken in 2005. Staff from both FE and HE concluded that they knew less about the other sector than they had previously thought. Learning about the FE sector had helped SCIT staff to understand some of the reasons that students from FE responded to their assessments in particular ways. There was a consensus that a common glossary needed to be developed across the sectors and that staff in FE and HE needed to be aware of differences in examination papers and assessments. It was clear that students in HE needed more guidance on assessment and needed to become aware of the different expectations of FE and HE. The seminar had raised staff awareness of student factors in the presage area of Biggs' (1999) 3 P model and of the factors related to assessment in the teaching context area that interacted at the process level of that model (see Chapter 2, Section 2). It was agreed that there was a need for further collaboration as this seminar had served as a starting point for raising cross-sector awareness to a level that could begin to directly impact on practice and serve to enhance the first year experience for students in HE.

6.5 The Welcome Week Challenge

Welcome Week, which had been formerly known as induction week, aimed to provide students with information on organisational issues such as courses, timetables, academic matters and support mechanisms. Another function of Welcome Week was that of encouraging social integration whilst at the same time introducing students to the staff in SCIT and to the facilities available to them during their first year in HE.

Discussion with students at the end of their first year in HE had shown that Welcome Week had not been as memorable or as informative for students as staff had hoped (see Chapter 5, Section 1.6). Earwaker (1992) noted that institutions which recruited non-traditional students know they have to make adjustments to provide a more receptive and less hostile environment. For these reasons, alternative ways of student induction were investigated. Edward and Middleton (1998) reported on a task-orientated induction programme that was very subject specific to undergraduates on engineering courses, where students had worked in groups to complete a challenge, using teaching staff as facilitators (see Chapter 2, Section 4). Students in this study had reported benefiting from the exercise. Participation in activities such as those in this task-orientated induction program were thought likely to increase a student's social integration into university life, which was considered an important factor militating against attrition in Tinto's (1975) model (see Chapter 2, Section 4).

It was anticipated that developing a similar challenge in SCIT would make Welcome Week more proactive, informative and engaging by providing the 'ice breaker' activities requested by students in the feedback obtained from questionnaires completed by the 2003/04 cohort at the end of Level 1 (see Chapter 5, Section 5). The challenge was also developed with the purpose of familiarising students with the teaching and support staff, and the facilities and resources, available to them in SCIT. Another aspect that the challenge hoped to address was the lack of knowledge students had regarding support and information relevant to new students and how to access this, especially the 'New Students' Website' (see Chapter 6, Section 2). It was also thought that the Welcome Week Challenge would provide an occasion for students to receive both academic and social feedback at the earliest opportunity which, according to Mackie (2001) was an important factor in a student's commitment to stay (see Chapter 2, Section 4).

Welcome Week had, formerly, comprised a welcome and introductory session followed by a timetable of events centered around talks on pathways, sessions in computer laboratories, a visit to the Learning Centre, a talk on PACE files (Personal, Academic, Career and Employability). The week culminated with a social event for all new students on the Friday afternoon. Attendance had varied through the week but generally had not been good.

For the pilot running of the Welcome Week Challenge with the 2005/06 cohort, it was decided to involve those students who had enrolled on full time Computing and Computer Science courses. Reasons for selecting these students were: -

- so that numbers were not so high as to make facilitation of the challenge difficult for staff to manage;
- it was considered necessary for a proportion of the students to have web development expertise;
- web development skills were appropriate for these students' continuing studies;
- combined awards students may attend induction for their other subject and part-time students had evening inductions to allow for work and family commitments.

Students on other courses such as Business Information Systems and Combined Awards were in a minority, and were to remain with a traditional Welcome Week, as web development skills were not necessarily relevant to their studies. It was planned that students would be put into groups of four, with a variety of backgrounds, abilities and experience in each group. This was in order that no group had several members who were experienced at web development while another group had none. This was also done to promote social integration as Mackie (2001) found that students reported difficulties in forming friendships, becoming part of a student group and participating in university social life (see Chapter 2, Section 4).

The groups were to be mixed as far as possible in terms of age, ethnicity and experience to promote discourse and integration between groups within the diverse student body. It was not possible to have a gender mix in all groups, as the ratio of males to females on these computing courses was 4:1 for those who attended the Welcome Week introductory session. Later inspection of the cohort showed a ratio of 11:1 males to females, which indicated that male students were those least likely to attend Welcome Week.

The students were to be introduced to the 'New Students' Website' during a Monday afternoon workshop session in Welcome Week. They were to be told that the website was in need of updating and required a new image. Their challenge for the week was that each group would produce a new version of the 'New Students' Website' containing all the important information that they thought a new student would require, in a user-friendly and attractive format. The new websites would each be presented by the group who made it, to the entire group of students undertaking the challenge on the Friday afternoon of Welcome Week in large lecture theatre. Several categories of prizes were to be awarded and the websites would be judged by a classroom voting system, with one member of each group, and some members of staff, having an infrared, remote control pad. These allowed students and staff to make multiple-choice selections that were fed back to the tutors, making this final presentation and voting session interactive.

The new Welcome Week started with a welcome and introduction as before, but students were also asked to complete a brief questionnaire that enabled staff to ascertain the age, gender and the level of experience in website development each student had. These questionnaires allowed the students to be placed into groups of mixed age and ability as far as possible. At this welcome and introduction session, students were also introduced to the concept of the Welcome Week Challenge and given an outline of how their week would be spent. The students were informed of their groups the following (Tuesday) morning and asked to contact group members by e-mail. They were given allotted half-day times during the week when they were to be working on the websites with staff facilitators available. The alternate half-day sessions were taken up with pathway talks, a student get-together and the Students' Union Freshers' Fair. This generally filled the students' timetable for the entire week.

There were some problems where a number of group members failed to respond to e-mails, so some groups were re-organised, combining low numbers into workable groups, but some groups worked with fewer than four members. Another problem that had not been foreseen was that planned computing facilities were unavailable. SCIT had moved into a new, purpose-built building with open plan workspace facilities. Computers were set in banks of four (which had dictated the group sizes) and members of staff would have had excellent access to the groups and been highly visible to the group members. At the start of Welcome Week, engineers announced that there were some faults to the electrical supply and that the workshops would not be available for use during that week. This meant that students had to complete their task in workshops in various buildings across the campus making it difficult for them to access staff. It also meant that staff were less able to act as facilitators to the student groups as they were not generally aware of which particular computer laboratories the student groups were in at any one time.

Despite these problems, groups of students were seen working in the computer laboratories on the campus during Welcome Week and staff made themselves available as far as possible. The presentation and voting session saw 22 groups out of a possible 37 presenting their websites. The session was organised so that four or five websites were seen and voted upon, with the winner of each group going forward into a final. Groups were not permitted to vote for their own website. After the preliminary rounds, the audience was reminded of the five websites in the final and voting revealed the overall winner. This was considered to be the students' choice, but prizes were awarded (by staff) for several categories including: the most humorous; the most sophisticated; the best content; the best teamwork effort and a few minor prizes. This session fostered and produced an extremely high level of engagement and enthusiasm from the students and it was noted that at 4pm on the Friday afternoon, of what had been a tiring week, students were completely engaged in the activity and in no rush to depart.

The standard of work in terms of the websites produced was very high, but that had not been the important factor in this exercise. The students had completed all the tasks that normally are assigned for induction week, and achieved a lot more besides, namely:

- they had made friends with some new people;
- they had used the hardware and software in SCIT;
- they had become familiar with several members of staff;
- they had found their way around the campus and its facilities;
- they had undertaken some teamwork;
- they had accessed WOLF and the 'New Students' Website';
- they had accessed the support and information that was available through SCIT, the University and the Students' Union;
- they had experienced the main lecture theatre as members of the audience and as presenters;
- they developed subject-specific skills in web development and some students had their first experience of "proper" computing – building a system to a given, albeit loosely defined, specification.

The students were asked to complete an on-line survey on the Welcome Week Challenge during the early weeks of semester 1 (see Appendix (viii)). The results are seen in Appendix (ix).

The survey form gave students the opportunity to comment on their responses to the questions which enabled some explanation to be added to the statistics. Some students had not attended Welcome Week for a variety of reasons including late enrolment, work commitments, illness and bereavement. One student commented: “I missed my first week as I was still moving into Telford, then I missed the second week as I was lost”. Consideration needs to be given to such students as late enrolment was linked to several negative aspects of a student’s university experience including poor performance according to Bennett (2003) (see Chapter 2, Section 4). Eight of the 57 responders had not known anything about the challenge. They clearly had not attended the welcome and introduction session at the start of the week when students were introduced to the challenge. One student commented: “I have no idea what it is – I was not told about it”.

For 14 students, difficulties with contacting their other group members had been the greatest problem. Students had been required to exchange e-mail addresses and should have all been in attendance at the sessions where the challenge was introduced and the groups were assigned. Another possible cause for students reporting not knowing about the Welcome Week Challenge was that the students were asked to complete this survey during a core module that would have included part-time students and students from combined awards. The percentage of students who had participated in the challenge, according to question 1, would have been higher if only those students who completed the survey had been those invited to participate in the challenge.

The survey revealed a number of issues regarding group working including difficulties making contact with others and students who simply failed to turn up. One student reported: “One [group member] turned up late and one not at all, but everybody that appeared contributed". Garland (1998) noted difficulties associated with getting group members to fully cooperate in group work (see Chapter 2, Section 6).

Two thirds of the students reported enjoying the challenge. Those who had not enjoyed it had generally had problems with team members or a lack of them. One student stated: "Not really, [I] would have enjoyed it if I had help and been able to find the rest of my group on the first day". This comment relates to the difficulties of getting cooperation among group members as reported by Garland (1998). Another student commented: "Fantastic fun, especially on the day with the shock winner". A third student stated: "It was a decent challenge and put me in good stead for my HTML module". The whole experience of higher education is meant to be stimulating and challenging according to Earwaker (1992) who also stated: "It is a necessary part of this experience that the student is 'put on the spot', challenged to work things out for him or herself, encouraged to live dangerously" (Earwaker, 1992, p. 124).

Eighteen comments were received from students regarding how well the challenge had introduced them to the resources and facilities, of which five were negative. One student stated: "Not really as we were told about these before the group work started". Other negative comments were generally about the lack of access to facilities in the new building which students realised was beyond the control of staff. Thirteen responses were positive about this aspect of the project and one student reported: "The learning centres were really good when doing the website". Another student commented: "I think it did as we got to use a few buildings and different rooms while making the website". It is not possible to make comparisons between these students' conceptions of how well they had been introduced to the resources and facilities compared to previous cohorts, but students had accessed the facilities and resources more frequently than in previous Welcome Weeks. This may, to some extent, have familiarised students with the working environment in HE, which had, according to Christie *et al.* (2004) been difficult to adapt to for some non-continuing students (see Chapter 2, Section 4).

Twenty one comments from students were received about whether or not the experience had improved their confidence in making presentations. Some of the seven negative comments were from students who did not like doing presentations. One comment typical of several was: “I never liked presentations, never will”. Fourteen positive comments revealed that some students had understood the benefits of achieving this first presentation. One student stated: “In a way, eventually I know I will have to present my work to a large group”. Another student commented: “I guess it did in a way, because I’m not a person to be bold in doing presentations”. Clearly this part of the challenge had given some students a level of discomfort, but most realised that this was an expected part of HE study. Earwaker (1992, p. 125) stated: “The higher education experience is bound to be a taxing one for students, and properly so. The point is not to make fewer demands, but to set them in a supportive context”.

Twenty comments were received from students on the subject of whether the challenge had helped their team working skills, of which half were positive. Some negative comments were posted from those students who had had problems with absent group members. One student stated: “It would have helped build team working skills if the whole group participated". Another student commented: "No, but it might have had I been able to find all my group". Positive comments were received from some students, one of whom stated: "As a team we built together a good base of information which was then implemented into the site". These comments were not unexpected as the problems associated with group working have been shown previously (see Chapter 2, Section 6).

More than half the students thought the challenge had helped them to get to know members of staff. Some students had realised some difficulties had arisen from the new building being unavailable, as one commented: "Staff were spread as much as the students were, especially in the MU [old] building, again, this was planned to be different if every one was in the MI [new] building…". Another student stated: "Yes the staff were very helpful and it did help". Introducing students to members of staff was an important part of the challenge as Bennett (2003) showed that relations with staff were a factor in student motivation (see Chapter 2, Section 4).

Students were asked to post comments on what they would do to make the challenge better for the next year. Fifty-three comments were received on a range of options for improving the challenge. Six students thought that choosing their own groups would have been better. This would, however, defeat the object of getting students to meet and work with students they had not met previously and to achieve groups with a mix of students from different backgrounds. Eleven students wanted the groups to be better organised with group members being physically introduced to each other and exchanging contact details. Three students thought the groups should choose their own topic, and some thought that there should be more but smaller prizes so that all or most participants received something. Some students requested that the challenge should be made compulsory and that all team members be required to participate, though two students thought that it should be optional. One student commented: “in all honesty, what you did this year was really quite good. I can’t think of any improvements you could make”.

6.5.1 Reflection and evaluation

The feedback from students on the Welcome Week Challenge had generally been positive and encouraging. Although some students would have preferred to choose their own group members, this option would, generally, not encourage students of different ages, backgrounds and abilities to come together. There were clearly difficulties in organising groups so early in the semester, but greater efforts can be made to ensure that group members get together with their facilitator at the earliest opportunity, perhaps by involving some Level 2 students as assistants.

Although three students thought that the challenge would have been better if they could have chosen their own topic, they had not realised how important it was that they should become familiar with all the topics on the ‘New Students’ Website’ during Welcome Week. Choosing their own topic would have meant that, as in previous years, some students remained unaware of the information and support that was available to them.

The prizes that were awarded could be reduced in size and value and increased in number. It seemed that many of the students who participated and completed the challenge would have valued this. Small prizes for completing the challenge would represent a form of positive feedback for students, which would enhance student motivation. The Welcome Week Challenge provided an excellent opportunity for early positive feedback on both social and academic aspects of HE. Early positive social and academic feedback enhanced a student's level of commitment, which in turn had been seen as a factor in retention, according to Mackie (2001) (see Chapter 2, Section 4).

Making participation in the Welcome Week Challenge compulsory would be difficult, if not impossible, but exploration of ways of making participation a requirement of certain modules would be likely to lead to a cultural change whereby students no longer viewed Welcome Week as an option. Whilst neither concrete evidence nor statistical analysis were available on the effects of the Welcome Week Challenge on attendance, progression and student success, there was anecdotal evidence amongst staff in the early weeks of semester 1 that attendance rates were higher and that students appeared to be better motivated than in previous years. This might, in part, be attributed to the new building and its modern facilities, and might also be partly due to the improved Welcome Week that sought to increase integration and commitment in students. It was considered by staff that the Welcome Week Challenge had fulfilled its function of providing students with information on organisational issues and support mechanisms, and giving students experience of the resources and facilities available to them whilst developing subject specific skills.

6.6 Teaching and Learning

The results from the investigation on student performance on modules at Level 1 in relation to the student's entrance qualification had raised issues, such as assessment, that were considered to be influential factors (see Chapter 5, Section 1.1). The findings were disseminated to staff at a seminar / discussion session. The module leaders for the eight modules that had been used in the analysis for the 2003/04 cohort were interviewed after the modules had been run for the 2004/05 cohort in order to determine what, if any, changes had been made to the modules and whether or not these changes were thought to have been beneficial to student performance. A list of questions was drawn up (see Appendix (x)) in order that all those module leaders could respond to a wide range of issues.

CP1016, Computer Architecture, a 15 credit, Level 1 module on the Computer Science route. The assessment régime comprised 1 component with three elements. Elements one (week 6) and two (week 11) were both on-line multiple choice tests (30% and 40% respectively) and element three was an electronic portfolio (30%) with six hand-ins, from week 2 to week 12. Higgins and Tatham (2003) reported concerns that students may be able to guess correct answers when MCQ format was employed for tests, which could mislead staff about the level of student learning, though the same authors also noted that it was possible to set questions that allowed students with greater application and analytical skills to shine (see Chapter 2, Section 7). The module leader had spent considerable time and effort constructing questions that, in his opinion, tested understanding and minimised correct guessing. The use of portfolios had been shown by Irons and Alexander (2004) to help with student motivation and ownership which in turn reduced plagiarism, while Irons (2002) concluded that portfolios reduced the overall student workload whilst facilitating the breadth and depth of assessment. The use of portfolios supported by other assessment tasks to assess basic knowledge was recommended by Biggs (1999) who found that the use of portfolios was, generally, seen as positive by students (see Chapter 2, Section 7).

The module leader had run this module for a number of years and had worked as part of the module team prior to becoming module leader. No changes had been made to this module between the 2002/03 and 2003/04 iterations, and none had been made since the 2003/04 running. The module leader was happy with both the student and staff workload and with the assessment régime, but would like to see an improvement in the pass rate (66% in 2003/04). One third of those who fail at first attempt pass the resit exam. Attendance on the module was generally high (around 90%) in the early weeks, dropping to about 50% in the middle weeks and increasing again towards the end of the semester.

When asked whether students had changed over the last few years, this module leader thought that, in his opinion while their attitude was similar, students were weaker academically now. He also noted a lack of respect from certain groups within the student body. Students were not well prepared for study in HE and they had no knowledge of the difference between collaboration and collusion, but he thought that mature students performed better overall than other groups. Several studies (Abramson and Jones, 2001; Lowe and Cook, 2003 and Yorke and Thomas, 2003) had shown that many non-traditional students were poorly prepared for HE study (see Chapter 2, Section 4). These studies reported that students found it difficult to adapt to the autonomous learning environment of HE from a highly prescribed FE learning environment with high class contact time.

The module leader was in no doubt that most students found this module challenging but was prepared to try other ways to improve student performance. This might include making improvements to the assessment items to ensure that assessment is neither biased nor unfair to any groups, as statistical examination of the results had shown there to be some problems with particular questions. Consideration was also being given to including PACE (Personal, Academic, Careers and Employability) files in the electronic portfolio. [These PACE files were designed to improve student participation and student skills in reflective evaluation]. Some minor modifications were planned for the 2005/06 academic year to make the content slightly less technical but no changes were being made to the assessment régime.

This module leader was expecting to remain in charge of this module for the foreseeable future. With regard to feedback, formative on-line feedback was given, and it was thought that most students accessed this. Attempts should be made to ensure that feedback is accessed by all students as Falchicov (2005) found that students indicated that they required more feedback and Ramsden (2003) reported that students found prompt feedback more useful than delayed comments. Mutch (2003) made the point that feedback is a developmental activity where students need to make sense of, and apply feedback, in order to facilitate their learning (see Chapter 2, Section 7).

When asked about possible effects caused by the move to the new building, the module leader thought that the most negative effect would be caused by the loss of one hour of contact time per week, due to a round of voluntary redundancies, not to the new building. This would mean the loss of tutorial time and it was thought that most learning occurred during discourse in tutorials. The teaching context experienced by students in tutorials was likely to be similar to their previous experience in FE where smaller groups encouraged greater levels of student interaction (see Chapter 2, Section 6). Thompson (1998) reported that students found it difficult to cope with a lack of individual attention largely due to the expectations they had brought with them from school or college where small groups were the norm and tutors had more time (see Chapter 2, Section 8). Since Biggs' (1999) 3 P model shows that the teaching context interacts with the student factors and affects the way that students approach their learning it is likely that this module leader was right to be concerned over the loss of tutorial time.

CP1052, Professional and Academic Development, a 15 credit, Level 1 elective module. The assessment régime comprised one component with two elements. Element one was a group project involving a group and an individual report (35%) and element two was a module portfolio, handed in continually with the final part handed in at week 12 (65%). The same module leader had run this module for the previous four years and had been a member of the teaching team on the module for two years prior to that. No changes had been made between the 2002/03 and the 2003/04 iterations, though the CV preparation had been moved to a Level 2 module in 2001/02. No changes had been made to the module between the 2003/04 and 2004/05 iterations.

When asked if he would like to make changes to the module, the module leader said he would like to include more reflection and evaluation in the PACE files produced by students. Although there had been some problems with the software used by students,

these PACE files were thought to have been a positive change. The formal presentation had been taken out prior to 2002 and attempts were being made to reintroduce it as it was considered to be an important component of graduate skills.
On the subject of assessment, this module leader thought that the assessment load was too low. The group assignment did not reflect real life and some students were disadvantaged. These could, in his opinion, be made to work positively if groups had no more than four participants with at least one mature student, one female student and only one natural leader, though this was not likely to be achieved owing to low numbers of mature and female students on SCIT courses. Garland (1998) reported on the difficulties associated with getting all group members to cooperate in group work activities (see Chapter 2, Section 6).

When asked if he thought the student workload was appropriate, the module leader thought that the content was about right, but that the assessment load was a little light. The staff workload was thought to be fair, and he was happy with the pass rate (80% in 2003/04). With regard to the attendance rate, this was fairly high for the early weeks, and then fell in mid-semester and increased again towards the end of the semester. This module leader had noticed a decreased level of ability in students over the last six years, and thought that students were not well prepared for HE study. His opinion was that most students at 18 years old were too young, that learning for its own sake was not appreciated, and that they were not familiar with independent learning. Comfort *et al*. (2002) found that students from FE or vocational backgrounds have had a very different type of teaching and learning experience prior to entering HE, which may not be taken account of (see Chapter 2, Section 6). When asked whether particular groups within the student body performed better than others on this module, the module leader thought that mature students performed best, probably as they recognised the need for doing the work. This concurred with the findings of Richardson (1994) who concluded that mature students were more likely to be intrinsically motivated and that the prior life experience of a mature student promoted a deep approach towards their studies in HE (see Chapter 2, Section 5). Female students were, in his opinion, generally the more committed, with British Asian females being the most committed of all. The module was not considered by its leader to be particularly challenging and he thought that some Computer Science students might be bored by its lack of technical elements.

In order to improve student learning on the module, the module leader had tried to introduce more student-centered activity with some success, e.g. small interactive tasks such as role identification and allocation. This type of activity had expanded over the last two years. Student performance on the module could be improved by increasing the level of student engagement on the module, though this was difficult, as the module leader stated: "students don't recognise learning strategies, therefore they don't apply one". He added that he thought students tended to rely on surface rather than deep approaches. Despite the diversity of backgrounds within this student cohort, which, according to Reiman (2004) make it unlikely that the same learning outcomes can be achieved by both traditional and non-traditional students, it is possible that students would engage in more appropriate learning activities by enhancing the alignment of the teaching and learning activities and assessment methods with the curriculum objectives (Biggs, 1999). This module was to cease running after 2005/06, though there was some debate in SCIT as to whether the learning outcomes could be transferred to other modules or whether they were best achieved in a dedicated module.

For the 2005/06 academic year, the assessment régime was changed slightly to group work (35%) and a PACE file with two hand-ins (weeks 3 and 10, 65%). The group work was a project that involved a group and individual reports with group and individual research and a presentation on an IT related issue. Elements of reflection and critical assessment were required in the assignment. The PACE file was expected to contain elements of reflection, analysis and evaluation of the student's learning experience together with records of their meetings with their personal tutor. This use of group working together with the PACE file provided an opportunity for improved student interaction and engagement with the material which, according to Biggs (1999) will undoubtedly enhance the student learning experience (see Chapter 2, Section 6).

CP1053, Information Systems Analysis, was a 30 credit, year-long, core module on both Computing and Computer Science courses at Level 1. The assessment régime composed one component with five elements. Element one was a test in the use of the ACCESS database (pass/fail). Element two was a time constrained test (seen) (30%). Element three was a written report (30%). Element four, a test in the use of a CASE tool was pass/fail and element five was a closed book, two hour examination. The wide range of assessment methods employed in this module would, according to MacLellan (2004), assess the full range of learning and prevent particular groups of students from being disadvantaged (see Chapter 2, Section 7). The leader for this module had run this module for two years and had led the previous module that this module replaced. No changes were made to this module between the 2002/03 and the 2003/04 iterations, except for the introduction of a summer school. This was a three-day course for students who had failed the module and involved two and a half days of teaching followed by a resit examination. Since the 2003/04 running, the module had been split into two separate modules, CP1062, Systems in Organisations and CP1063, Systems Analysis, mainly because there were two distinct parts that were not well linked. Further changes had been made in that a seen, time-constrained test replaced the formal examination that had previously been used. The initial pass rate for the module was 70% rising to 80% after the resit exams. The module leader had found that the pass rate had not changed since the introduction of the summer school and thought that those students who passed after the summer school may have passed the ordinary resit exam. It had been hoped that the summer school would have increased the pass rate, but it was thought that it might have led to an increase in the pass mark (rather than the rate).

Moving to two separate modules led to changes to the assessment régime. The formal, closed book, two-hour end exam was reduced to one and a half hours with fewer questions, with one topic being moved to a group report. CP1062, which ran in semester 1 and had a lighter assessment load, while CP1063, a semester 2 module had a tougher assessment load owing to the way the subject matter had been divided between the two modules. The module leader thought that the assignments had been more evenly spread across the academic year in CP1053. There was a reduced choice of exam questions in the new modules. Formerly the students had to attempt six out of eight questions, but in the new modules they had to attempt all questions as each one addressed a particular learning outcome. There was, though, a degree of choice within the questions themselves. This change meant that students were unable to avoid areas of the syllabus which had previously been possible and therefore was more effective in realising the teacher's objectives. According to Biggs (1999) the method or type of assessment is, in itself, less important than that the assessment realises the teacher's objectives, whilst taking into account practicality and validity. The 80% pass rate (after resit examinations had taken place) was considered acceptable by the module leader who noted that the initial poor pass rate of 60% in June was largely due to non-attendance and/or non-submission of work by students. Considerable improvements had been seen in the pass rate for CP1053 since this module replaced a previous module for which the pass rate had been 50%. It was not possible to determine whether or not staff on this module thought students had changed over the last few years as students were split into groups according to the award they were on, and the module ran in four iterations, making comparisons difficult.

When asked whether students were prepared for higher education, this module leader thought that some were and some were not. The biggest problem he had found was with the students in the middle who were not quite prepared, but could progress with sufficient support and good teaching. This comment reflected the findings of several studies (Abramson and Jones, 2001; Earwaker, 1992; Ozga and Sukhnandan, 1997 and Zeegers and Martin 2001) which found that many students were poorly prepared for HE but could progress with considerable support and guidance (see Chapter 2, Section 4). The first part of the module was thought to be less challenging to students than the second part, mainly because the material in the second part was new to most students. Changes had been made to the seen test (to include group work) in the new modules, which the module leader had hoped would improve student performance and stated: “it may also help to improve learning as students learn from each other and engage more”. Students themselves, according to Biggs, (1999) provide a continually accessible resource for discussing, reciprocal questioning and mutual support in groups within large classes.

The three tests undertaken in computer laboratories were marked by the tutor who gave feedback immediately. The time constrained test in semester 1 was marked, but the module leader thought that this could be improved by giving more feedback. Lack of, or delayed feedback could not be expected to advance student learning according to Yorke (2000). The individual report based on a group investigation was marked and written feedback comments given. This represented a considerable effort by staff since there were generally around 300 students on this module.

The module leader was hoping that the move to the new building would have little effect on the running of this module, though lectures would have to be delivered in a different building to the practical sessions. He thought that tutorials could be a problem as students may disappear. Mass tutorials linked to lectures with extra staff might help to keep students engaged, but the module leader commented: “if we could find a way of breaking them [the students] down into small groups and keeping them in those groups, then small groups could work well, that also avoids the mass exodus”. Group work, according to Biggs (1999), was found to be useful in reducing the feeling of anonymity experienced by many students in the large classes found in HE (see Chapter 2, Section 6).

CP1062 was assessed by one component with three elements in the 2005/06 academic year. Element one was a test on ACCESS (pass/fail), element two was a time-constrained short answer test (50%) and element three was a time-constrained test on the use of IT in an organisation. CP1063 also was assessed by one component with three elements in 2005/06. Element one was a presentation (50%), element two was a test (pass/fail) and element three was a time-constrained closed book examination of one and a half hours duration (50%). Across the two modules a wide range of assessment methods was employed that should reduce the chances of some student groups being disadvantaged by the assessment method (see Chapter 2, Section 7).

CP1054, Introduction to Computing and Programming, was a 30 credit, year long, Level 1 module on the Computing course. There were two assessment components on this module, with component one (60%) having three elements. Element one was a portfolio (60%) based on fundamental tasks and students were provided with a schedule showing interim deadlines for specific tasks. Element two was an application with documentation (30%), and element three was a phase test (10%). Component two was an unseen written exam (40%). This module was new for the 2002/03 cohort. The module leader had made several changes after the first iteration by removing some content and reducing the depth covered in the second semester as she felt that there was an excessive amount of material in the module programme. This was thought to be a positive move in terms of supporting a deeper approach to learning, as the literature showed that students who perceived that their workload was high were more likely to adopt a surface approach to learning and to perceive learning as a requiring a quantitative increase in knowledge according to Entwistle, 1991; Kember *et al*., 1996 and Ramsden, 2003 (see Chapter 2, Section 5).

After the module ran in the 2003/04 academic year, it was changed to become two separate 15 credit modules. For the first module, the pass rate was higher; details were not available at the time of writing regarding the pass rate for the second module. More material was removed from the module content between the 2003/04 and the 2004/05 iterations. One major assessment was removed, though the portfolio continued.

This module had previously used VB.net as a programming language and all students were now doing JAVA, so this module and its material were ceasing and a new module was being developed using JAVA. The module leader felt that, after several changes, she was happy with the assessment régime that had been developed for the two new modules. Module one was assessed using an on-line MCQ (that gave feedback and employed penalties for wrong answers in order to reduce guessing) and a portfolio. Module two also included a portfolio in its assessment régime, and had a formal exam at the end of the module. The student workload was fair, though there was not a lot of work done between the sessions in the module leader's opinion. The staff workload had improved since the introduction of on-line submission.

Attendance on the module was generally around 75% but was lower if there was an assessment on another module, though the module leader had noticed an improvement in student attitude between the 2002/03 and the 2003/04 cohorts. Generally she felt that student attitudes were worse than ten years ago and she thought that students were not well prepared for HE study though, in her opinion, mature students performed better than others. This reflected the opinions of other module leaders and the literature (Abramson and Jones, 2001; Earwaker, 1992; Ozga and Sukhnandan, 1997 and Zeegers and Martin 2001) (see Chapter 2, Section 4), and Richardson (1994) (see Chapter 2, Section 5). This module was considered by staff to be both challenging and interesting for students. In order to improve student learning on the module, this leader would like to introduce more on-line material and peer marking. Peer marking has been shown to be beneficial to both student learning and the provision of feedback according to Falchikov (2005). In order to improve student performance more mock tests would be beneficial in the module leader's opinion. Mock tests would cause students to spend more time with the material. Race (1993) showed that anything is learned by doing, practicing and learning from mistakes, rather than listening to experts or reading about it (see Chapter 2, Section 7).

Feedback had been given to students each week on their portfolio in the form of a mark and an explanation on their previous week's work. Tutors were expected to put overall comments at the end, and comments throughout the work. For the resit exam, papers were available at the summer school on request, but there was no specific policy on this. The module leader considered that the level of feedback given to students had risen over the two years of this module. This would support student learning as Ramsden (2003) reported that regular and timely feedback was essential to student learning (see Chapter 2, Section 7).

CP1055, Desktop Applications, was a 15 credit, Level 1, elective module. The assessment régime comprised one component with two elements. Element one was the production of a compound document that was e-mailed to the tutor in week 6 (40%) and element two was to design, implement and test a spreadsheet model for a small business (week 12) (60%). The module leader had run this module for three years and had reduced the amount of programming required in the assignment between the 2002/03 and the 2003/04 iterations, and had removed the test plan requirement. No changes had been made since the module ran in 2003/04, though the module leader was considering swapping the assignments around for the 2004/05 running as a number of students had failed to attend for the last week of the module. This change in the order of the assignments would, in the module leader's opinion, lead to an improved performance as this would increase the student workload in the first half of the semester, and reduce the student workload for the second half of the semester. Since many modules have major assessments at the end of the semester, this move might be beneficial in reducing student perceptions of a heavy workload. A positive link was found by Kember *et al.* (1996) between a surface approach to learning and a heavy perceived workload (see Chapter 2, Section 5). The assessment régime was fair, the module leader thought, even though the resit examination was a test, it was the student's own work and tested both knowledge and understanding by means of an open-book test. The student workload was fairly light, though the module leader thought that some students might not cope with more. The staff workload was fair. The module leader was not happy with the pass rate (73% in the 2003/04 academic year) but felt that it could improve with more student effort. Attendance was around 75% on a weekly basis. This module leader thought that students were not well prepared for studying in HE as they often appeared reluctant to ask for help, and had difficulty getting started on new things, but commented: "the move to the new laboratories [in the new building], where doing demonstrations will be easier, may help". This may help to promote student engagement with their work which in turn will impact on their learning focused activities that reside at the process level of Biggs' (1999) 3 P model (see Chapter 2, Section 2).

When asked whether there was a difference in performance between groups of students, the module leader had found that students on Computer Science courses generally performed best. Computer Science is a more technical course containing more mathematics than Computing and is generally studied by more able students (see Chapter 2, Section 3). The module leader thought that the module was challenging, but not until late in the semester when the second assignment was being undertaken. In order to improve student learning, the module leader would like to introduce each weekly session with a working demonstration. This had been too difficult to date, as it required carrying equipment to rooms, but should become standard in the new purpose-built computer laboratories. To improve student performance, the module leader thought that swapping the two assignments round would not only improve performance but also improve the feedback received by students, as the second element was more complex and required structured feedback.

The assessments were swapped for the 2005/06 academic year as the module leader had planned. No other changes were made to the assessment régime.

CP1056, Operating Systems and Networks, was a 15 credit, Level 1 core module for Computer Science and Computing courses. The assessment régime comprised one component with three elements. Element one was an on-line phase test (30%, week 6), element two was also an on-line phase test (40%, week 12) and element three was an electronic portfolio that was handed in every two weeks in workshops. The portfolio comprised a series of tasks, undertaken in workshops, the results of which were compiled into the electronic portfolio. The module leader had run this module for three years and the only changes he had made to the module between the 2002/03 and the 2003/04 iterations was that the number of times the portfolio was handed in had been reduced from six to five. No changes had been made since 2003/04, and the module leader was happy with the staff and student workload, the attendance rate (around 80%), the assessment régime and the pass rate (79% in 2003/04). This module leader had tried many different tactics to improve student learning including gap notes, voting systems in lectures, building computers in class and looking at different trades and industries and collecting data for jobs to see different data types and how they are used. This range of activities was far removed from the didactic style of teaching formerly found in HE institutions, and involved teaching methods that would enable students to engage with the material to be learned. Biggs (1999) stressed the importance of using the teaching method that is most likely to enable students to realise the learning objectives (see Chapter 2, Section 6). The module leader had also employed pre-examination mock tests and voting to show how styles and structures of questions were used in order to improve student performance in examinations. Feedback was given both formatively and summatively at the end of the first phase test. Feedback from portfolio hand-ins was expected to be acted upon and addressed by the student before the final hand-in. This involved students with a high level of re-engagement with their work and their feedback. Mutch (2003) described feedback as a developmental activity and referred to the requirement that students made sense of, and applied feedback in order to further their learning (see Chapter 2, Section 7). With regard to the move to the new building, the module leader felt that the improved computer workshops might enhance the learning experience for the students.

No changes were made to the assessment régime for the 2005/06 academic year.

CP1057, Programming for Computer Scientists, was a 30 credit, core module on the Computer Science course. The assessment régime for this module consisted of two components. Component one had two elements with element one comprising a series of four multiple choice tests in weeks 5, 9 and 13 in semester 1, and week 5 in semester 2 (60%). Element two was a software development project (40%). Component two was a two-hour closed book examination at the end of semester 2. The module leader for CP1057 had run this module for three years and had worked as part of the module teaching team for two years prior to this. Between the 2002/03 and the 2003/04 iterations some changes had been made to the assessment. Software had been used to generate individual assignments in order to prevent collusion, which had been a problem prior to this. A new problem had arisen in that students were outsourcing via the internet, which was proving difficult to control.

Since the 2003/04 iteration, the module had changed to become two, 15 credit modules. The module leader had found these changes to be favourable as in the 2005/06 running, 109 out of 138 students either made it to the final examination or switched awards. In semester 2, 85 out of 109 students completed the module with 75 out of 85 expected to do very well.

When asked if he would choose to change anything else in the module, the module leader replied that he thought he made all the changes necessary for the module to run effectively now, but it would have to change further owing to the school review and impending staff changes. From the 2006/07 academic year, all students except for those on Combined Awards and on Computing for Business courses would be studying this module, so, in order to give students a better chance of completing semester 1, most of the mathematics content was being moved into semester 2. The module leader was happy with the assessment régime, mainly because it was changed frequently. The staff workload was fair and the students had a full workload in the module leader's opinion. The pass rate had shown an improvement whilst run as one module (CP1057) (56% in 2002/03, 63% in 2003/04), figures for the subsequent two modules were not comparable as not all students completed both. The attendance rate was good but dropped towards the end of the module, which the leader thought was largely because students lost interest after completion of the practical element and missed the theory at the end of the module. The 2003/04 cohort had been better motivated than the 2002/03 cohort in the module leader's opinion, though he also thought that students were, in general, not well prepared for HE study. This concurred with other module leaders' opinions and the literature which highlighted that students were, in general, poorly prepared for HE study (see Chapter 2, Section 4). When asked whether any particular groups performed better than others, the module leader thought there was an ethnic divide with British/European students performing better than their Asian counterparts on this module, which he considered to be a very challenging module. This finding could not be explained.

The module leader would like to introduce peer marking of a pre-test, and an in-class test on programming in order to improve student learning, as he had seen evidence of deeper learning in the practical aspects, with problem solving achieving good results. Gibbs, (cited in Brown and Glasner, 1999) showed how student performance was improved by weekly problem sheets being marked at peer assessment sessions. This involved, not only students spending time on task, but also generated appropriate learning activities. This reflected Biggs' (1999) 3 P model, which shows that when learning-related activities generate appropriate, deep approaches to learning, it leads to higher quality learning outcomes (see Chapter 2, Section 7). The module leader felt that students took a surface approach to the end examination and hence achieved poorer results. Weekly quiz sheets had been introduced with six questions in the tutorial related to the previous week's work, which had proven to be successful. This again involved students spending time on task. The module leader also felt that he had made all the changes possible to the assessments to improve student performance. The students received feedback on their programming tests in class in week 7 and there was a tutorial for feedback in week 8, though some students failed to attend. Greater efforts should be made to ensure all students receive and respond to feedback as Yorke (2001) reported that belated or no student feedback cannot be expected to advance student learning (see Chapter 2, Section 7).

The move to the new building would have an effect on the students as the previous arrangement of lecture – tutorial – lecture – workshop would not be possible owing to the lack of lecture theatres or tutorial rooms. The students would, instead, have three-hour sessions in computer laboratories, which the module leader thought would lead to students becoming even better at the practical aspects of the module, but worse at the theory aspect of the module.

CP1057 became the two modules CP1068, Fundamentals of Programming using JAVA (15 credits, semester 1) and CP1069, Object Orientated Programming using JAVA (15 credits, semester 2).

For 2005/06, CP1068 and CP1069 were both assessed by means of a laboratory-based practical test (40%) and a class-based theory test (60%).

CP1061, History of Computing, was a 15-credit, Level 1 elective module. The assessment régime on this module consisted of one component with two elements. Element one was a group work project with a report on a topic in the history of computing (50%) and element two was an individual essay examining a current development within computing in a historical context (50%). The module leader had run this module since its inception three years previously.

Some changes had been made to the module between the 2002/03 and the 2003/04 iterations. The module leader felt that the assessment was too broad with group work as a key skill and an individual essay, with a group presentation and a report. It was decided that essay writing, researching and referencing would be focused on, and group working would be left to other modules. For the 2003/04 academic year students undertook research for an essay and created a portfolio of that research. The module leader found that this level of focus on essay writing and the research undertaken led to an improvement in the standard of essays produced by the students, but was not convinced that the portfolio had achieved one of its aims, which was to encourage students to engage regularly with their work.

In order to increase students' level of engagement and to increase attendance at tutorial sessions, the module leader made further changes to the assessment for the 2004/05 academic year. The assessment régime consisted of one component with two elements. Element one was the essay which was weighted 100%, and element two was tutorial work which was pass/fail. This tutorial work was essentially the work that had previously been done for the portfolio, but was moved to being completed in tutorials, of which the students had to attend at least six out of nine. The work was marked in class, to achieve the pass required for this element. The work comprised the steps of preparation of research for the essay, and included references; research; use of the Learning Centre; the essay plan and reflection on how this work had been undertaken. Despite some difficulties that arose because of poor rooming, and no separate rooms for tutorials, the module leader noted: "this led to an increased work rate, the essays improved, there was less plagiarism and the students seemed to be more engaged". The module leader had involved students in spending time on task, engagement with the material to be learned and in reflection. These activities were more likely to generate appropriate learning focused activities which lie at the process level of Biggs' (1999) 3 P model (see Chapter 2, Section 2).

The award structure had changed for the 2004/05 academic year, which meant that fewer students were able to study this module. The group of students who enrolled on this module were academically weaker students than those in previous years, but most passed the module, the pass rate increased and only six out of 55 students failed to attend the tutorials. This emphasis on tutorials had increased the attendance rate considerably in the module leader's opinion. The requirement to attend six out of nine tutorials ensured that the assessment was likely to enable learning rather than simply to measure learning (MacLellan 2004) (see Chapter 2, Section 7). The module leader felt that the assessment régime required no further changes. The student workload was appropriate and the fact that students were given weekly tasks to do meant that only two students required extensions for work on the module. The pass rate had increased according to the module leader who also recalled that the 2002/03 cohort had ranged from excellent to poor in performance with some drifting away as group work could depend on one student. This problem with group work was reported by Garland (1998) who found that not all members fully cooperated in group work (see Chapter 2, Section 6). The 2003/04 cohort had included all the previous year's failed students and, though more able students showed increased grades, some students who had previously been propped up by group work showed a weaker performance. Students in the 2004/05 cohort were generally weaker students than in previous years, but appeared more focused and lower numbers meant that they kept together and showed an improvement in performance. In line with other module leaders and the literature (see Chapter 2, Section 4), this module leader felt that students were not well prepared for HE study having found that they struggled with essays and often had poor English skills. No particular groups performed noticeably better than others on this module as the module leader had found that most of the students were of a similar gender and background.

The module leader thought that this module was not particularly challenging and stated: "it takes them [the students] to their boundaries - but not beyond". In order to bring about an improvement in student performance the module leader would have liked to use a better room with better facilities and would have preferred to have tutorials in smaller groups (< 20 students). On the subject of improving student performance, the module leader thought that she had done all that she could and that the students had done better than ever before. She was saddened that this module was ceasing to run after 2004/05, though some of the material studied in this module was to be included in the module CP1052 in the 2005/06 academic year.

Feedback had been given on the essay by means of a grid with comments. Comments were given to the class as a whole, and then students could see staff individually about the comments in their grid. The tutorial work was marked and commented on weekly (six times) and this, according to the module leader, had been instrumental in improving student performance. Both Falchikov (2005) and Ramsden (2003) reported the importance of frequent and timely feedback in enhancing student learning (see Chapter 2, Section 7).

6.6.1 Reflection and evaluation

The module leaders who ran these eight, Level 1 modules had all endeavoured to find ways of promoting higher levels of student engagement with the material to be studied. This was a very positive finding as it was shown in Biggs' (1999) 3 P model that it is at the process level of the model, where learning focussed activities take place, that students adopt a particular approach to learning. By encouraging students to engage and re-engage with their work, staff were likely to encourage deeper approaches to learning in their work and minimise surface approaches (see Biggs, 1999; Laurillard 2002 and Race, 1993). Brown and Glasner (1999) showed how weekly tasks promoted learning by increasing the amount of time students spent on a given task (see Chapter 2, Section 7). In the 2002/03 academic year, four of the eight modules used a form of portfolio assessment as part of the assessment régime. This had increased to five by 2004/05. The use of portfolios had been shown by Irons and Alexander (2004) to increase student motivation and decrease plagiarism. The discussions with staff had revealed a fairly high awareness of student presage factors including a lack of preparedness for HE study. This had accounted for some of the measures taken including a reduction in some of the content of both curriculum and assessment in a number of modules. Cook and Leckey (1999) reported that in order to ease the transition from school/FE into HE, it was essential for staff in HE to have an informed view of the diversity of backgrounds, needs and aspirations of their students (see Chapter 2, Section 4).

Of these module leaders, most had reported an increase in the module pass rate, which was attributed, in part, to the changes to the assessment régime and curriculum. The assessment régimes were varied which meant that, overall, no particular groups of students were disadvantaged. It was an unfortunate factor that owing to a round of voluntary redundancies and a move to the new building, several of the modules had run for the final time and further analysis would not be possible.

Chapter 7. Conclusions and recommendations

7.1 Introduction.

This research set out to address four research questions, which were:-

1. What is the influence of the entrance qualification and feeder institution on a student's approach to learning?
2. What is the significance of these factors on students' achievement in their first year in higher education?
3. To what extent can the information obtained from questions 1 and 2 be used to develop appropriate interventions to student approaches to learning in the form of learning support and changes to teaching and assessment?
4. Can a theoretical model that identifies the characteristics of a successful student be developed from the research findings?

The first three research questions remained unproblematic throughout the study. Question four expanded to include the development of two models, the second model being for the retention of students on Computing and Computer Science courses in HE.

4. Can two theoretical models be identified from the research findings, (1) a model that identifies the characteristics of a successful student, and (2) a model for the retention of students on Computing and Computer Science courses in HE?

This chapter examines each of these questions in relation to the research findings; draws conclusions and makes recommendations for further research.

7.2 What were the influences of entrance qualification and feeder institution on a student's approach to learning?

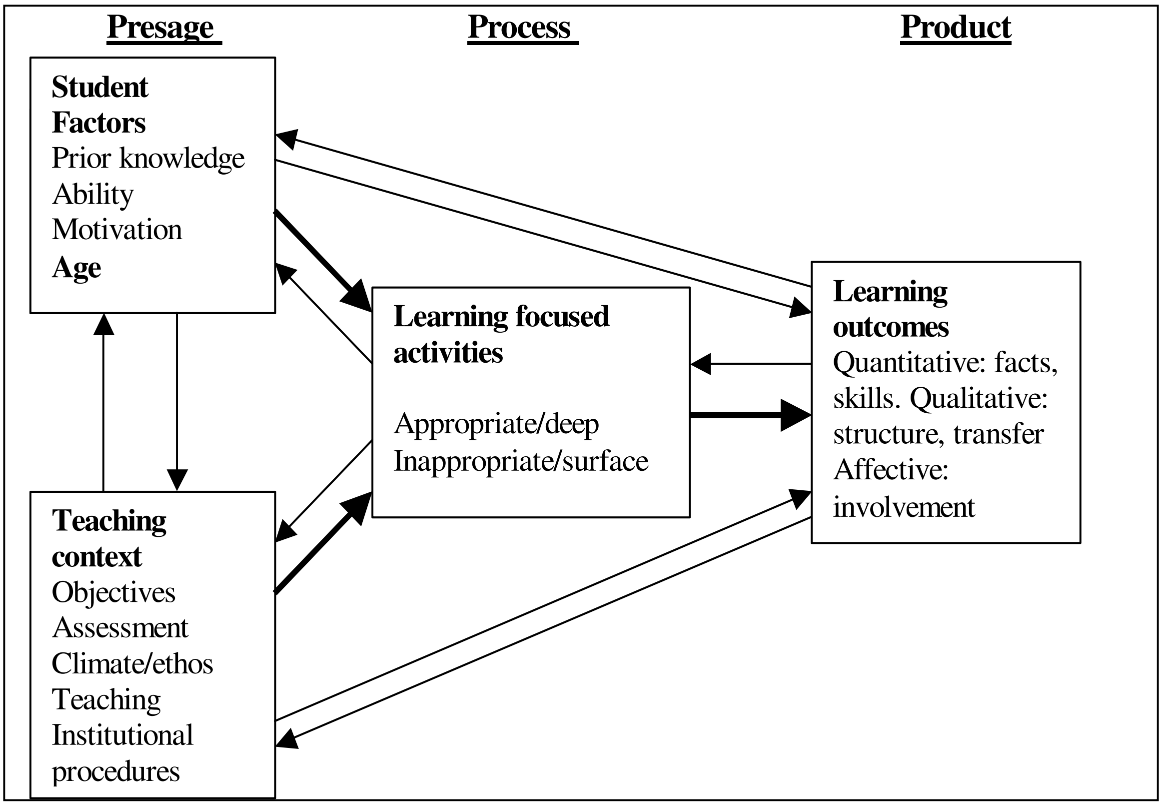
It was concluded that there were no notable differences between students with A levels, an AVCE or 'other' entrance qualifications and their approaches to learning as defined by analysis of the results of the ASSIST questionnaire.

Students' preferences for different types of course and teaching were investigated by entrance qualification. Where there were differences between the three groups, generally it was found that students with 'other' entrance qualifications scored more highly on the statements that reflected a deep approach to learning. As 'other' entrance qualifications comprised five groups, further investigation of those groups was undertaken in order to explore the differences between the groups. The finding that, when there was a difference between the groups, students with higher mean ages scored more highly on the deep approach scale than their younger counterparts was not wholly expected. Further investigation of the data sets found that, across all three data sets, (the 2002/03 Level 1 cohort in the pilot study, the 2003/04 cohort at Level 1 and the same cohort at Level 2) where there was a difference between groups of students, consistently, students with higher mean ages scored more highly on the deep approach scale, and students with lower mean ages scored more highly on the surface approach scale.

The feeder institution attended by students prior to entry to HE was not found to be influential in students' approaches to learning. This was thought to be due, in part, to the fact that A levels and AVCE courses were studied in both schools and FE colleges.

It was concluded that, while the entrance qualification and the feeder institution attended by the students were not significantly influential in a student's approach to learning, age (defined in this research as 'under 21' and '21+') was a statistically significant factor. This suggests that there is, therefore, a case for adding age to the student characteristics in Biggs' (1999) 3 P model of teaching and learning (see Figure 13).

Figure 13. Biggs' (1999) 3 P model of teaching and learning (amended).



7.2.1 Recommendations

Further research into the influence of age on students' approaches to learning is needed to increase understanding of the developmental aspects of this issue. It would be valuable to know how this finding related to all students in HE regardless of course or subject. This particular study investigated students on Computing and Computer Science courses; the work of Richardson (1995) however, was undertaken with students on Psychology, Sociology and Social Anthropology courses which indicated that this finding was not specific to students at this institution or to Computing and Computer Science courses in particular. The findings of this study build on the work of Richardson (1995) who hypothesised that mature students were more likely to adopt a deep approach to their academic work and were, conversely, less likely than younger students to adopt a surface approach.

7.3 What was the significance of entrance qualification and feeder institution on students' achievement in their first year in higher education?

It was possible to conclude that students with AVCE qualifications performed less well than other students, on all eight modules at Level 1, investigated in this study. Two of the results for AVCE students were statistically significant, but the trend was consistent across the modules in the analysis. The difference between the results for students with an AVCE in the pilot study and the 2003/04 cohort had been attributed in part to changes that had been made to the AVCE curriculum and to changes made to some of the Level 1 modules in HE, though this was inconclusive. Analysis of this 2003/04 cohort at Level 2 revealed that differences between the groups had diminished with A level students performing better than AVCE students on four modules and students with AVCE performing better than those with A levels on the remaining four modules.

AVCE students were seen to perform better in modules that embraced an assessment régime that involved frequent engagement with the material. The findings from the assessment project had revealed that students on AVCE courses in FE worked in smaller groups and had more tutor contact and prompting with deadlines than they encountered in HE. This was also likely to have been the case in schools as fewer students in schools studied the AVCE award; hence groups were likely to be small. Prosser and Trigwell (1999) suggested that students' prior educational experiences were fundamentally important to their approaches to study and their subsequent learning outcomes and stated:

> In taking account of this student variation in their teaching, university teachers need to help their students to be aware of the effects of prior experiences on how they approach their studies, and to offer students an appropriate academic orientation to their subject (Prosser and Trigwell, 1999, p. 27)

This quotation seemed particularly appropriate here as it reflects the findings of this study which has revealed extensive student variation in each cohort with students bringing a wide range of previous educational experiences to HE. This was found to present staff with challenges in determining the best way to promote engagement and an appropriate academic orientation to their subject in light of such diversity. There were likely to be many factors that were involved in the performance of students with AVCE entrance qualifications at Level 1 in HE, but one of the primary intentions of this research was to identify students at risk of being unsuccessful at the earliest opportunity. It was possible to conclude from this research that students entering

Computing or Computer Science courses at this institution were at increased risk of poor performance if they had an AVCE entrance qualification.

The performance of students with A levels had been inconsistent as they had performed less well than those with ‘other’ entrance qualifications in the pilot study but performed better than ‘others’ in the 2003/04 cohort though this was outside statistical significance. Given that A levels were considered to be the traditional entrance qualification into HE, it was generally expected that these students would perform better than all other groups at Level 1. It was thought that the wide access policy of this institution meant that we tended to recruit students with lower points tariffs than those required by many other institutions. The mean points tariff of students entering Computing and Computer Science courses in 2002/03 was 133.3. In 2003/04 the mean points tariff increased to 154.4, though this was still slightly below two grade C results at A level. It was concluded from these findings that many of the students recruited by this institution had not performed well at A level, and therefore, may not be fully representative of students with A levels at other HE institutions.

The feeder institution attended by students prior to entry into HE was not found to have any significant influence on student performance and achievement at Level 1 or Level 2. The feeder institution had previously been considered by staff in SCIT to have been influential in student performance hence the findings of this study have been able to dispel this misconception.

7.3.1 Recommendations

This research has provided a snapshot of the transition and performance of students with an AVCE qualification. It is recommended that student performance on modules at Level 1 is monitored in order to evaluate the influence of the new BTEC National Diploma award on student performance and achievement in HE. Tracking the progress and achievement of students with regard to their entrance qualification would be made easier if the student's main entrance qualification was available on SITS. Currently the entrance qualifications are banded into groups on SITS. Clearly, a number of students do have a mix of A levels and AVCE qualifications, but many students have studied one or principally one award to gain entry to a particular course in HE.

7.4 To what extent can the information gained from questions 1 and 2 be used to develop appropriate interventions to student approaches to learning in the form of learning support and changes to teaching and assessment?

It was concluded from the qualitative data obtained from students that students wanted improved information on many aspects of university life and requested more personal tutor support. Students also reported concerns regarding assessment and the change in teaching and learning in HE compared to their previous experience.

The intervention program sought to use both the quantitative and qualitative data to bring about improvements to:

- the information given to students;
- the personal tutor system;
- the assessment régime;

- Welcome Week;
- teaching and learning.

The conclusions and recommendations for each of these items are detailed in the next section.

7.4.1 The information given to students.

It was concluded that students had scant knowledge of many aspects of HE such as support systems, module grade composition and where to access this type of information. Staff in SCIT knew the information was available from several sources but were unaware that students were not able to access it and were reluctant to ask for help. This research, therefore, helped to dispel the misconception held by staff that students would quickly become familiar with sources of help and information. Students who are not well informed are more likely to have unrealistic expectations of HE. This results in their expectations not being met which was shown by the literature to have a negative affect on student motivation (see Chapter 2, Section 8). Being well informed was thought to be an integral part of the model of the characteristics of a successful student (Figure 13). Providing information in a format that students found easy to access was considered to be an important component of the model for enhanced retention (Figure 14). The development of the 'New Students' Website' was a step forward in providing a range of information in a student-friendly way, but this was impeded by the fact that not all students were able to navigate through the WOLF virtual learning environment to access this website, so its success in meeting the requirements of students was limited.

The move to include the 'New Students' Website' in the Welcome Week Challenge ensured that a higher number of students accessed, and interacted with the website, and did so at the earliest opportunity. This should increase the chance of students being able to identify and access appropriate support sooner rather than later should a problem arise, and also provided a more holistic approach to raising awareness of sources of help and support through student involvement.

7.4.1.1 Recommendations

A senior member of staff has taken on the responsibility to monitor and update the 'New Students' Website' which will continue to evolve. It is recommended that those students who are not on courses that take part in the Welcome Week Challenge and those who enrol late or transfer from other institutions are made aware of the website and its contents to ensure these groups of students are not disadvantaged.

7.4.2 The personal tutor system

It was concluded that the difficulties found with the personal tutor system were mainly due to high student numbers. Personal tutors in SCIT inevitably had relatively large numbers of students as tutees owing to the high staff: student ratio found in modern HE institutions. The use of WOLF as a communication tool was supportive to their roles according to staff (see Chapter 6, Section 3). The introduction of a booklet to provide information to assist tutoring staff in their roles was initially ineffective in that staff were reluctant to access paper-based information. This was similar to the finding regarding students who failed to access paper-based information. It was not possible to determine if all staff had a preference for accessing on-line information, or whether this was a characteristic of staff in SCIT. Feedback from staff in SCIT indicated that placing a desktop link to the booklet would be an effective way of increasing staff interaction with the information. These steps were taken and early feedback from staff has proved positive. The support provided by the personal tutor system was considered to be an important factor in the model of enhanced retention of students (Figure 14) by increasing a student's sense of belonging and being an additional source of information. These factors were also considered important in the model of the characteristics of a successful student (Figure 13).

7.4.2.1 Recommendations

It is recommended that personal tutors receive appropriate training and support in their role. Further research into ways of supporting staff in their personal tutoring roles, and providing them with relevant information on the wide range of support available to students, need to be explored. Efforts should be made to promote early interaction between personal tutors and their tutees.

7.4.3 The assessment régime

It was concluded that there were differences between FE and HE in the meaning given to terminology commonly used in assessment, and differences in the level of support given to students in terms of tutor support and resubmission of work. There was a mismatch of staff conceptions of the meaning given to terms such as 'discuss' and 'formative' between the two sectors. This dispelled the misconception held by staff that students fully understood the meaning of such terms. Qualitative data obtained from Level 1 students in SCIT found that they were anxious about the early assessments in HE and required more support and guidance (see Chapter 5, Section 1.6). The literature review also showed that student motivation was affected by teaching and assessment and that student motivation decreased when expectations were not met (see Chapter 5, Section 1.6). Staff in both FE and HE requested further seminars on the subject of assessment as both came to realise the importance of cross-sector awareness. The Assessment Project has given staff in HE an opportunity to modify or redesign assessment tasks in light of their knowledge of assessment in FE. For this reason, assessment has been included in the model for enhanced student retention (Figure 14), and is part of the teaching and assessment factor that is an important component in the model of the characteristics of a successful student (Figure 13). The move to the new building coupled with the extensive voluntary redundancies meant that many modules were changing structure and module leader for the 2005/06 academic year hence it was not possible to determine the effectiveness of any changes made.

7.4.3.1 Recommendations

It was clear that cross-sector awareness of assessment was not as good as staff had thought, but was greatly enhanced by the Assessment Project and the FE/HE seminar that followed. It is recommended that assessments, especially those occurring early in Level 1, are adapted to meet the needs of the diverse students found in HE. The development of a common glossary of assessment terms was requested by staff across the two sectors. It is recommended that further collaboration between FE and HE takes place as it had been agreed by staff that the first seminar had served as a starting point for raising awareness to a level that could impact on, and enhance the first year experience for students in HE.

7.4.4 Welcome Week

Welcome Week sought to provide students with appropriate information whilst encouraging social integration and introducing them to members of staff and the facilities available to them. It was concluded from the qualitative data obtained from students in this study that the existing Welcome Week provision fell somewhat short of its mark with many students lacking basic practical knowledge at the end of Level 1, and requesting 'ice-breaker' activities in the early weeks (see Chapter 5, Section 1.6). Mackie (2001) reported that difficulties in forming friendships, becoming part of a student group and participating in university social life were noted as problems for some students (see Chapter 2, Section 4). Involving students, in groups, to redesign and present a revised 'New Students' Website' challenged students to develop team working skills; to access and review the available material on student support and to familiarise themselves with the computer laboratories and members of staff in SCIT. The use of interactive peer assessment on the final day promoted high levels of engagement and participation.

Whilst there were some difficulties associated with assigning groups so early in the first week, it was concluded that Welcome Week had adopted a holistic approach to the process of the week in terms of promoting early interaction with staff and peers and access to facilities by combining activities and support. The Welcome Week Challenge had been a positive step in enabling students to access information on organizational issues and support systems during their first week whilst at the same time, gaining experience of the resources and facilities available to them and developing subject specific skills. Direct comparisons with previous cohorts were not possible as the move to the new building and module changes would all impact on the students' experiences, but members of staff reported improved attendance and student motivation in the early weeks of Semester 1 following the first running of the Welcome Week Challenge in 2005.

7.4.4.1 Recommendations

The Welcome Week Challenge is being taken forward by senior lecturers with responsibility for Level 1 Students. It is recommended that greater efforts are made to introduce group members to each other and to their tutors at the earliest opportunity in order that problems with groups can be quickly resolved. Student requirements in terms of information, support and guidance should be regularly monitored as the student profile is constantly changing and diverse groups have varying needs. Welcome Week is an important component of the model to enhance student retention (Figure 14) and is central to many aspects of the model of the characteristics of a successful student (Figure 13) by being a vehicle for early interaction with peers and tutors; for providing challenge and support; by informing through activity and engagement.

7.4.5 Teaching and learning

It was clear from the literature that students could not be instructed to adopt a deep approach to learning (see Chapter 2, Section 5). It was concluded that the previous educational experience of the student had to be taken into account, as did the teaching context they experienced in HE whilst developing teaching environments that enabled students to undertake appropriate learning activities.

Taking account of their previous educational experience entailed acquiring information on the nature of the mode of curriculum delivery and mode of assessment in FE. Staff were presented with this information at a SCIT seminar and at the FE/HE assessment seminar whilst also being informed of student performance on their modules, defined by entrance qualification (see Chapter 5, Section 1.1). The module leaders had all taken steps to increase student engagement with the material to be studied by various means, including reducing the content of both the curriculum and assessments in some modules. The increased use of portfolios as part of the assessment régime for some modules was also likely to have benefits as portfolios have been shown by Irons and Alexander (2004) to increase motivation and decrease plagiarism. The use of portfolios also required students to engage and reengage with their work which was likely to encourage a deeper approach to their learning (see Chapter 2, Section 7). The previous educational experience of the student and the teaching context they encounter in HE are both important presage factors in Biggs' (1999) 3 P model which interact at the process level of the model to determine the approach adopted by the student (see Chapter 2, Section 2). The transition from FE to HE in terms of teaching and learning is an important component in the model of the characteristics of a successful student (Figure 13). That teaching and learning needs to take account of the diversity of students and their previous educational experiences makes it an important component in the model for the enhanced retention of students (Figure 14).

7.4.5.1 Recommendations

It is recommended that module leaders continue to employ a range of teaching and assessment strategies that endeavour to increase student engagement. Further research needs to be carried out into the new BTEC National Diploma that has replaced the AVCE as a vocational alternative to A levels, in terms of the teaching methods and assessment régimes it employs. This will enable staff to build on existing formats and ensure that no student groups are disadvantaged by the teaching methods and assessment régimes encountered in HE.

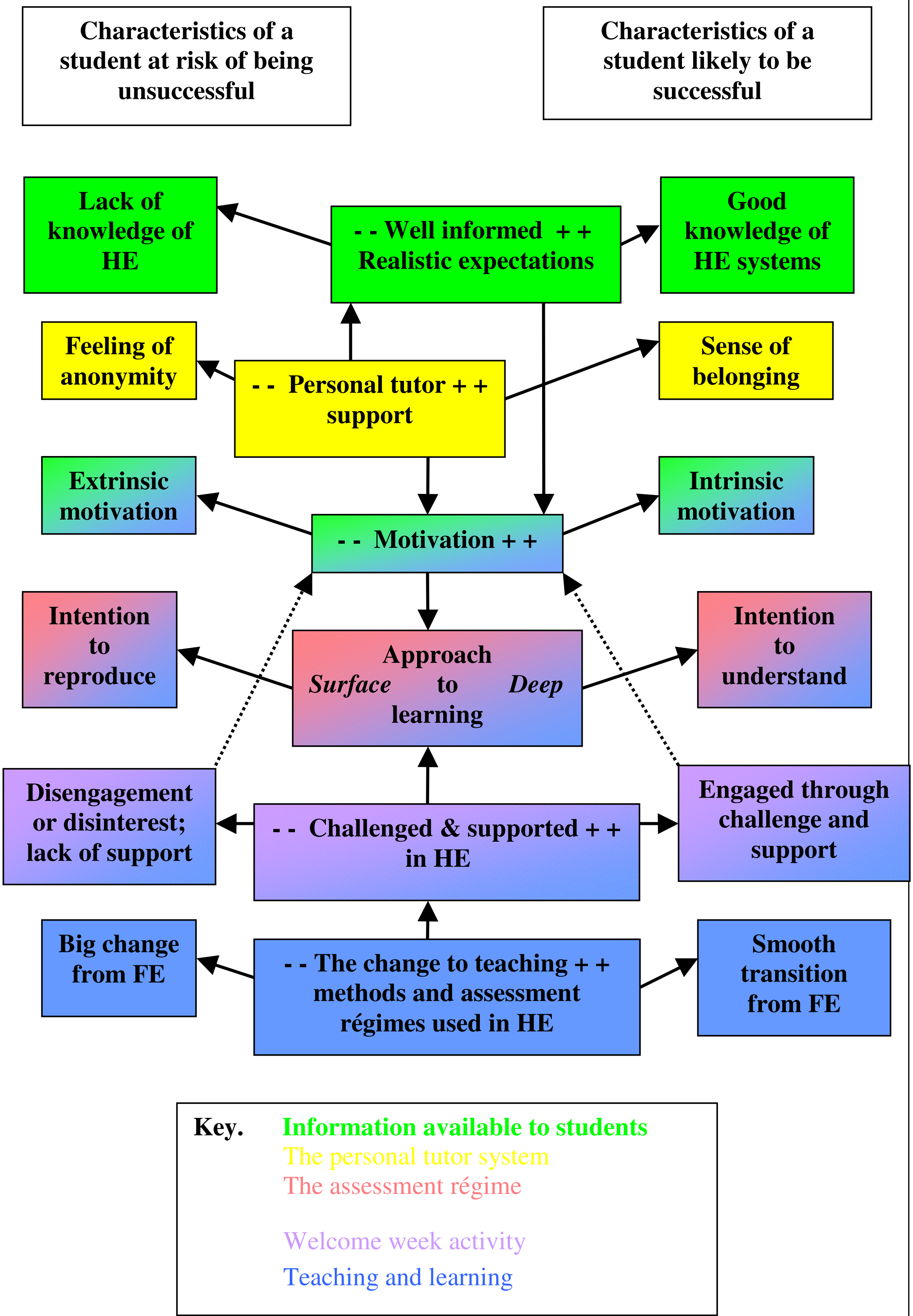
7.5 Can two theoretical models be identified from the research findings; (1) a model that identifies the characteristics of a successful student, and (2) a model for the retention of students on Computing and Computer Science courses in HE?

7.5.1 A model that identifies the characteristics of a successful student

This research has shown that students require easily accessible information on all aspects of HE, but also that they need steering towards that information. Early introduction to their personal tutors and regular meetings were requested by students. Students revealed that they had concerns and difficulties with the mode of assessment in HE. A number of students requested 'ice breaker' activities during Welcome Week and the literature highlighted the need for students to develop a sense of belonging and to receive positive feedback at the earliest opportunity (see Chapter 2, Sections 4 and 7). The change in the teaching and learning style in HE to that found in FE was also quite stressful for many during the transition period (see Chapter 2, Section 6).

How well informed students are and how well supported they feel are student presage factors that will impact on their learning focused activities. The teaching methods and assessment régimes encountered by students and the nature of their induction into HE are teaching context presage factors that will also impact on the students' learning focused activities. From this information a model that identifies the characteristics of a successful student on Computing and Computer Science courses at this wide access institution has been developed (see Figure 14).

Figure 14. Model of the characteristics of a successful student on Computing and Computer Science courses at one wide access university

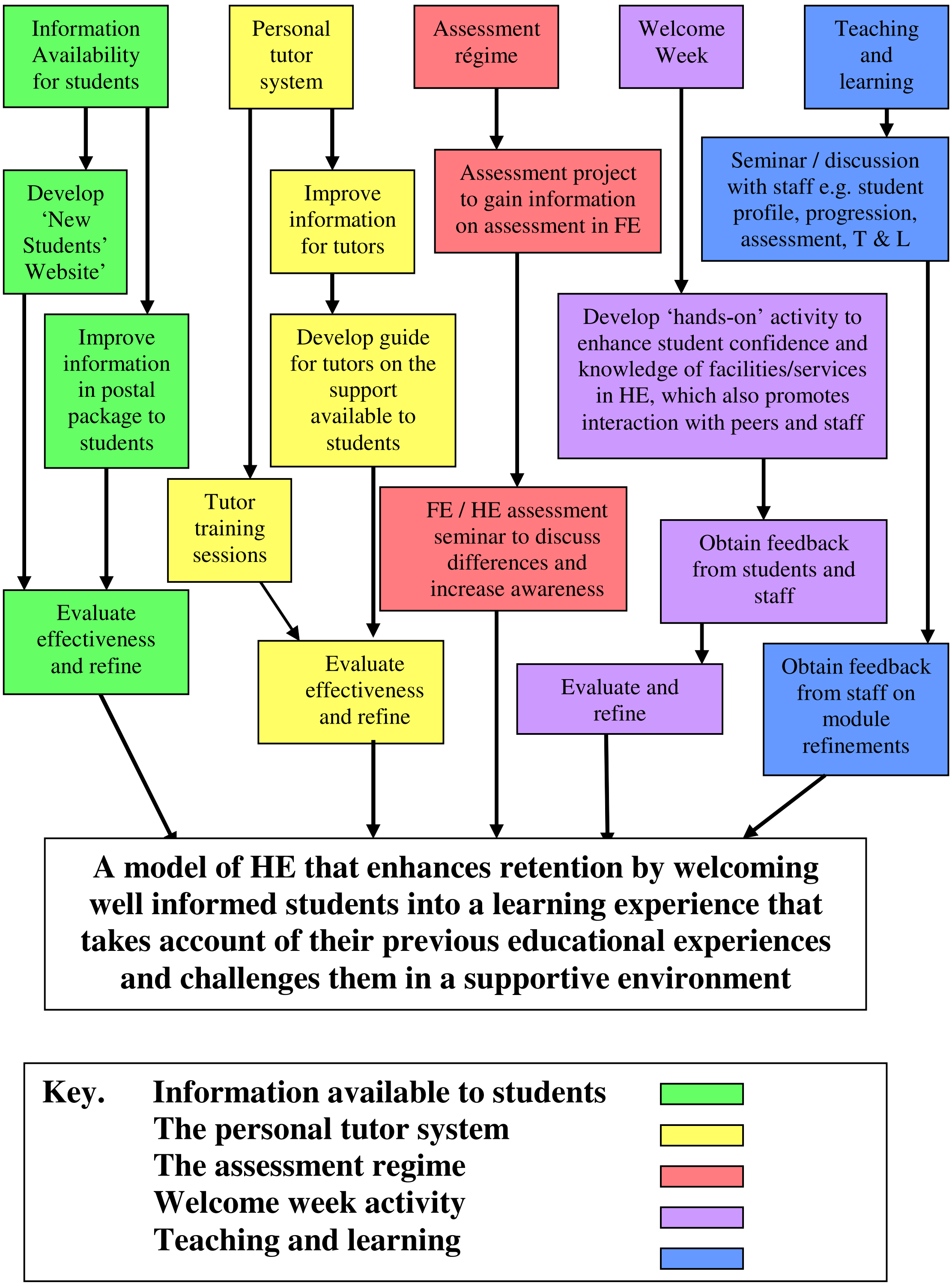


The model (Figure 14) is colour coded in a way that relates to the steps taken in the intervention program (see Figure 10) and to the model for the enhanced retention of students produced in Chapter 7, Section 5.2.

7.5.2 A model for the enhanced retention of diverse students

From the development of the intervention program for this project and from the findings of the project it was possible to posit a model for the enhanced retention of diverse students on Computing and Computer Science courses at this wide access university. The model (see Figure 15), based on the steps taken during this action research project, leads to the provision of a more holistic transition into HE for students and enables issues related to student diversity to be better addressed.

Figure 15. Model for enhanced retention of diverse students on Computing and Computer Science courses at one wide access university



7.6 Summary and conclusions

This project began with the goal of improving the achievements of non-traditional students on Computing and Computer Science courses at one wide access institution with a diverse range of students, many of whom are drawn from the local multi-cultural community. The first objective was to attempt to identify students at risk of poor performance at the earliest opportunity. This research was exploratory as it enabled the researcher to gain information on the students and their educational backgrounds and provided a platform on which to base further research. The finding that students with an AVCE entrance qualification performed less well than other groups fulfilled this objective and prompted further research into the teaching methods and assessment régimes employed on these vocational courses. The resulting FE/HE assessment seminar for staff enabled greater awareness to be developed between the two sectors that served to increase staff and researcher knowledge of student factors related to teaching and assessment.

The collection of data from large numbers of students over a three year period presented significant challenges as students, for many reasons, may not have attended on the day data collection took place. Students may have transferred to other courses or modes of study between Levels 1 and 2, and not all those students surveyed in FE proceeded to enrol on Computing or Computer Science courses at this institution. Students were also reluctant, despite inducements, to attend group discussions on their experiences of the transition to HE. The qualitative data that were obtained from students in focus group discussions and by means of an open-ended questionnaire enabled changes to be brought to Welcome Week that were seen as positive by both staff and students. Further refinements are planned to ensure that the 2006 running of the Welcome Week Challenge involves a greater number of students and is wholly located in the new building which will improve access to, and interaction with the staff facilitators and tutors. Changes that were made to the personal tutor system and to teaching and assessment in Level 1 modules were smaller in nature, but nevertheless worthwhile, as they were based on the information obtained from students during the focus group discussion and in the open-ended survey. These changes require evaluating annually and may form the basis for further research into supporting and retaining students at this institution. Whilst it is not possible to compare two cohorts, first year students could be asked provide feedback on their experiences of the transition, which could be used by staff to evaluate the effectiveness of changes that had been made.

The various aspects of this project have been handed over to those members of staff who became actively involved in the development and implementation of them. New members of staff are introduced to and involved in Welcome Week, personal tutor training and staff development as a matter of course, while the New Students' Website is frequently updated. It is important that staff continue, possibly through the FE/HE liaison committee, to be aware, and take account, of the teaching and assessment methods employed on courses that serve as entrance qualifications to HE. Staff should also take the opportunity to interact with current research and attend conferences on supporting diverse students. Only by knowing the students and their educational backgrounds, can staff meet the needs of those students. The two models (Figures 14 and 15) developed from the research findings provide a significant contribution to current knowledge of those factors that enhance a smooth transition to HE and the characteristics of a successful student in a wide access university.

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Appendix (i)

The ASSIST questionnaire

A S S I S T

Approaches and Study Skills Inventory for Students

(SCIT Version 1b)

This questionnaire has been designed to allow you to describe how you go about learning and studying. The technique involves asking you a substantial number of questions, which overlap to some extent to provide good overall coverage of different ways of studying. Most of the items are based on comments made by other students. **Please answer all the questions**.

Background information

Enrolment No: …………………………… Age: …… years Gender: M/ F

Previous institution, college or school: ...……………………………………………………

Please briefly give your **main** reason for choosing to study a higher education course.

…………………………………………………………………
……………

A. What is learning?

When you think about the term "LEARNING", what does it mean to you?
Please rate each of these statements in terms of how close they are to your own way of thinking about learning by circling one number for each statement.

5 means "very close to my way of thinking" 1 means "very different to my way of thinking"

		Very close				Very different
a.	Making sure you remember things well.	5	4	3	2	1
b.	Developing as a person.	5	4	3	2	1
c.	Building up knowledge by acquiring facts and information.	5	4	3	2	1
d.	Being able to use the information you have acquired.	5	4	3	2	1
e.	Understanding new material for yourself.	5	4	3	2	1
f.	Seeing things in a different and more meaningful way.	5	4	3	2	1

B. Approaches to studying

The next part of this questionnaire asks you to indicate your agreement or disagreement with comments about studying. Please work through the comments, giving your immediate response by circling one number. In deciding your answers, think in terms of your previous experience of higher education.

5 means "definitely agree" *1 means "definitely disagree"*

		Agree				Disagree
1.	I manage to find conditions for studying which allow me to get on with my work easily.	5	4	3	2	1
2.	When working on an assignment, I keep in mind how best to impress the marker.	5	4	3	2	1
3.	Often I find myself wondering whether the work I did on my course was really worthwhile.	5	4	3	2	1
4.	I try to understand for myself the meaning of what we have to learn.	5	4	3	2	1
5.	I try to organise my study time carefully to make good use of it.	5	4	3	2	1
6.	I find I have to memorise a lot without really understanding it.	5	4	3	2	1
7.	I go over the work I have done carefully, to check that it is accurate.	5	4	3	2	1
8.	Often I find the amount of material we are having to cope with is too much.	5	4	3	2	1
9.	I try to look at the evidence carefully and reach my own conclusion.	5	4	3	2	1
10.	It is important for me to feel that I am doing as well as I can.	5	4	3	2	1
11.	I try to relate ideas I come across to ideas from other modules.	5	4	3	2	1
12.	I tend not to read much beyond what is needed to pass.	5	4	3	2	1
13.	I find myself thinking about ideas from lectures when I am doing other things.	5	4	3	2	1
14.	I think I am quite systematic and organised when it comes to revising for exams.	5	4	3	2	1
15.	I look carefully at tutors' comments on course work to see how to get higher marks next time.	5	4	3	2	1
16.	I find much of the work uninteresting or irrelevant.	5	4	3	2	1

		Agree				Disagree
17.	When I read, I try to find out exactly what the author means.	5	4	3	2	1
18.	I am pretty good at getting down to work when I need to.	5	4	3	2	1
19.	Much of the material I am taught makes little sense at the time.	5	4	3	2	1
20.	I try to keep focused by thinking about what I want to get out of the module.	5	4	3	2	1
21.	When I am working on a new topic, I try to understand how the ideas fit together.	5	4	3	2	1
22.	I often worry about whether I'll be able to cope with the work.	5	4	3	2	1
23.	I often question things I hear in lectures or read in books.	5	4	3	2	1
24.	I put more effort into the work when I feel I am getting on well.	5	4	3	2	1
25.	I concentrate on learning just what I need to know to pass.	5	4	3	2	1
26.	I find that study can be quite exciting at times.	5	4	3	2	1
27.	I am good at following up some of the reading suggested by lecturers or tutors.	5	4	3	2	1
28.	I keep in mind who is going to mark an assignment and what they will look for.	5	4	3	2	1
29.	I sometimes wonder why I came here.	5	4	3	2	1
30.	When I am reading, I stop from time to time to reflect on what I am trying to learn.	5	4	3	2	1
31.	I work steadily through the semester, rather than leave it all until the last minute.	5	4	3	2	1
32.	I am not really sure what is important in lectures so I try to make as many notes as I can.	5	4	3	2	1
33.	Ideas in course books or articles often inspire my own thoughts.	5	4	3	2	1
34.	Before I start work on an assignment or exam question, I think about the best way to solve it.	5	4	3	2	1
35.	I often seem to panic if I fall behind.	5	4	3	2	1
36.	When I read, I examine the details carefully.	5	4	3	2	1

		Agree				Disagree
37.	I put a lot of effort into studying because I am determined to do well.	5	4	3	2	1
38.	I gear my studying closely to just what is required for assignments and exams.	5	4	3	2	1
39.	Some of the ideas I come across on the course I find really interesting.	5	4	3	2	1
40.	I usually plan out my week's work in advance, either on paper or in my head.	5	4	3	2	1
41.	I keep an eye open for what lecturers think is important and concentrate on that.	5	4	3	2	1
42.	I was not really interested in the course, but had to take it.	5	4	3	2	1
43.	Before tackling a problem or assignment, I try to work out what the real meaning is.	5	4	3	2	1
44.	I generally make good use of my time.	5	4	3	2	1
45.	I often have trouble in making sense of the information I have to remember.	5	4	3	2	1
46.	I like to develop my own ideas even if they don't get me very far.	5	4	3	2	1
47.	When I finish a piece of work, I check to see that it meets the requirements.	5	4	3	2	1
48.	I sometimes lie awake worrying about work I think I won't be able to do.	5	4	3	2	1
49.	It is important for me to follow the argument and understand the reasoning behind it.	5	4	3	2	1
50.	I do not find it difficult to motivate myself.	5	4	3	2	1
51.	I like to be told what to do in essays and assignments.	5	4	3	2	1
52.	Some academic topics are so interesting that I would like to keep on studying them.	5	4	3	2	1

C. Preferences for different types of course and teaching

5 means "definitely like" *1 means "definitely dislike"*

		Like				Dislike
a.	Lecturers who tell us exactly what to write down in our notes.	5	4	3	2	1
b.	Lecturers who encourage us to think for ourselves.	5	4	3	2	1
c.	Lecturers who show us how they think themselves.	5	4	3	2	1
d.	Exams which allow me to show that I have thought about the course material.	5	4	3	2	1
e.	Exams or tests which need only the material provided in the lecture notes.	5	4	3	2	1
f.	Modules in which it is made very clear which learning materials we have to use.	5	4	3	2	1
g.	Modules where we are encouraged to read around the subject.	5	4	3	2	1
h.	Learning materials that challenge me and provide deeper explanations.	5	4	3	2	1
i.	Learning materials giving straightforward information.	5	4	3	2	1

Thank you very much for spending time completing this questionnaire: it is much appreciated.

Appendix (ii)

Focus group poster and transcript

How was it for you?

First year Computing and Computer Science students.

Please come to our informal discussion so we can use your ideas to improve the start of university life for other students.

We need your input so that we can find out what you like, what you don't like and what you really need. Hate us or love us, your thoughts and ideas are very important to us.

Bring your sandwiches, we will provide drinks, crisps and biscuits.

When – Mon. April 26th MU422 and Thurs.

April 29th MU206 both 1pm to 1.45pm

<u>Focus group April 2004. Attended by 3 male students, one AVCE, one overseas and one mature student with previous A levels.</u>

- Do you think that the course you did in FE links into the course you are doing here?
- *Mostly a re-run of A-level; OK (AVCE)*
- If not, how and why?
- *N/A*
- How do our methods of assessment differ to those you did in FE?
- *Deadlines more difficult. In college we were more prompted and it (the assignment/work) was broken into chunks.*
- What about class sizes, do they affect how you work?
- *They are bigger and rowdy; its difficult to concentrate.*
- Support for your learning- how was it in FE, how is it here and have you coped with any changes to the way support is given?
- *Not used.*
- How was enrolment?
- *Well organised but big queues.*
- Was induction week what you expected?
- *Can't remember, instantly forgettable.*
- Did you - a) find your way round; *mostly.*
- b) find it useful; *parts*
- c) find it fun; *no*
- d) get to know staff / students? *Not really.*
- What would be helpful to students in induction week?
- *Building map, (floor plan).*
- What should we not include (what was not useful)?
- *Don't know.*
- How did you feel about HE study before enrolling?
- *Looking forward to it.*
- How did you feel after induction week?
- *Same.*
- How did you feel by Christmas?
- *Got used to it, felt more laid back.*
- How did you feel by the end of semester one?
- *Relief; it had gone quickly also.*

- Do you think it is the same for other students?
- *I think so.*
- Do you think the way you do your learning has changed in HE?
- *Definitely, tighter deadlines (mature, A level).*
- *Not really, I take it in, remember it and spit it out for exams (AVCE)*
- *Much harder work here but better than college (overseas).*
- Has your thinking to other things in life changed?
- *I'm more prepared to take a second look at issues (mature, A level)..*
- Was your course what you expected?
- *No.*
- What about lectures; tutorials and workshops?
- *In tutorials things were not explained well.*
- *Lectures are well backed up by WOLF.*
- Were notice boards easily found and did they help you?
- *Where are they?*
- When you get a module guide, what do you read first?
- *Weighting of assignments.*
- What do you not bother to read in the guide?
- *All the rest.*
- Do you understand grades, credits, components and elements?
- *No, I wish I did, how do you work out a degree classification?*
- Do you use the learning centre?
- *Yes, but not a lot.*
- Do you buy or borrow most of your books?
- *Both.*
- Can you get the books you need?
- *Sometimes, but I may have to wait.*
- What could we do to make studying a more enjoyable experience? (Given that we have to assess you along the way).
- *More discussion and question and answer sessions*
- *A fuller day but less often.*
- Have you considered dropping out? If so, why?
- *Yes, when work piled up.*
- What made you stay?
- *My parents are proud of me being here.*
- Do you feel that you have/are coping with the change from FE to HE?
- *Yes but it takes a while.*
- What could be done in FE to help you to move into HE?
- *It would be better if someone from HE came to talk to us in FE about the work, the grade point system etc.*
- Do you have any other comments to make?
- *The canteen is too expensive.*

Appendix (iii)

Open-ended questionnaire

Student issues and ideas, good luck with your studies, thank you.

1. What were the most difficult or stressful things during your change from attending school/college to studying at university?

2. What could we have done to make this better or easier?

3. What could have been done in school/college to prepare you better for university life?

4. What is the best thing about studying here?

5. What is the worst thing about studying here?

6. Do you have any sensible suggestions to make about first-year issues?

Appendix (IV)

Table of results

Table 26. Student issues and ideas. Feedback from group discussion and questions.

What were the most difficult or stressful things during your change from attending school/college to studying at university?	**Where to target intervention** 1= in FE (talk by SCIT rep) 2= in postal pack 3= induction/welcome week 4= personal tutor 5= in modules/module leaders 6= FE staff 7= other
Intensity of workload	1, 4, 5, 6
Timetable (lack of) and year timetable (terms etc)	1,2, 4
Deadlines for assignments	1, 4,5
1st assignment – what was required; report writing	3,4,5
Big jump from 6th form to HE work	1,4,5
Change in teaching and learning style	1,4,5
Tutors having less time	1,4,5
Welcome week	2, 3
Lack of information	1,2
Getting lost (site and building map)	1,2
Working environment	1,3
Lectures	1,4
Finances	1,4
What could we (SCIT) have done or provided to make this better or easier?	
Increased use of online notice boards for rooms, times, exams, timetables etc.	5
Ice breaker activities	3
Longer and more tutorials	4,5
More programming workshops	5
More direction signs in buildings	7
Pathway guide sent out earlier	2
Slower change from FE to HE teaching	1,4,5
Better relating of workshops to lectures	5
Personal tutor introduction earlier	4
Early knowledge of SCIT software used	1
Crowd control in lectures	3,5
Help with 1st assignment	4,5
Spread assignments better	4,5
Better explanation of programming and VB.net	4,5
More 1-2-1 tutorials	4

What could have been done in school/college to prepare you better for university life?	
SCIT rep to college to talk to students	1
Course not linking into HE course	1,6
Tour of university while at college	6
Understand shorter academic year but increased intensity of work	1, 4, 6
More responsibility for own and group work	6
Less spoon feeding at school/college	6
Talk on money management	1, 6
More programming	6
Computer languages	6
VB6 in college, VB.net in SCIT	6
Make qualification for university harder	7
Understanding of university marks system	1, 6
More English and report writing	6
What is the best thing about studying at university?	
WOLF	
Programming	
Games development	
Supportive staff	
Availability of lecture notes	
New challenges (VB. net; comp architecture)	
Relaxed environment	
Good facilities	
Good quality and local	
Learning centre	
Choice, freedom and independence	
What is the worst thing about studying at university?	
Big assignments (college was weekly)	1,4,5
Too many people/big class sizes	7
Poor PCs	7
Assignment clumping	1,4,5
No personal tutor	4
Unavailability of staff	4,5
Tutorials (ineffective)	4,5
Module content not explained	4,5
Not enough 1st year support	4,5
Difficulty understanding workshop sheet	5
Timetable	
Student attitudes	
Loud/noisy lectures	5

Do you have any sensible recommendations to make about first-year issues?	
Examples of work/pre-assignment tutorials	4, 5
Send book list out early	2
Term time dates etc sent out early	2
More module information	3, 4
Timetabled slot with personal tutor	4
Better awareness of organisation and self-study	1, 3, 4
More user-friendly for new students in welcome week	3
More workshop time	5
Student discount at Waterstones	7

Appendix (v)

Table of results for staff

Item	Objective
Taster days into Uni for school/college students who have applied, or may apply to Wolves. With transport and lunch provided if possible. Using enthusiastic members of staff and possibly 1st year students.	To familiarise students with location/environment and staff. To promote realistic expectations of the learning environment, workload, assessments and support. To promote an understanding of independent learning and private study. To gain hands-on experience in computer workshops.
Provision of earlier and improved information on pathways, modules and reading lists.	To enable students to be better informed and organised.
Introduction of personal tutor system/training/support.	To enable members of staff to fully understand the role and responsibility of the personal tutor, and to be supported in that role.
Handbook of current student information for use by personal tutors.	To give personal tutors quick and easy reference to comprehensive information relevant to student support.
Induction challenge. A teamwork task to produce a report with tutor support. To include learning centre and IT/e-mail sessions. To include a treasure hunt and an awards session.	To give students a sense of belonging, challenge and achievement during induction week. To familiarise students with their peers, staff and their environment.
Introduce some interactive methods into teaching sessions	To build on the challenges and independent learning that will have been introduced in the induction challenge.
Assessment task review (1)	To ensure that assessment is designed to test understanding rather than memory
Group-work introduction for some components in some modules	To encourage the development of team working and collaborative working. Use of some peer marking to reduce reliance on one team member.
Personal tutor timetabled slots.	To enhance the sense of belonging, and support. To enable early detection of problems with regard to study, work, family and personal life. To provide continuity for students.
Pre-assignment tutorials	To enable students to fully understand the requirements of the work and the expectations of staff. Examples of poor, average and excellent work could be discussed. Important in semester one.
Assessment task review (2)	Large assignments could include a plan of weekly tasks in semester one to enable students to adapt from weekly tasks in FE to our larger but fewer assignments.
Feedback sessions	Whether this is in the module or with the personal tutor, it is important for students to respond to feedback in order for learning to take place.

Issues relating to teaching and learning that were raised by first year students.

Personal tutors

- Some students requested regular scheduled meetings (4-6 weekly) with their personal tutor. They wanted an early introduction and for the personal tutor to be regularly available to discuss assignments (and planning), module content, organisation and self-study.
- Issues such as workload, timetable, change to teaching and learning style and time/numbers constraints could also be discussed at these meetings as some students felt they hadn't known what to expect.
- Finances and learning difficulties were other issues that could be raised at personal tutor meetings.

Module leaders

Assignment issues

- Students were used to being given small, weekly assignments in college and found difficulties coping with fewer but larger assignments. Some possible ways of helping are: -
- Pre-assignment tutorials with examples of good and poor work (hypothetical) especially in sem. 1
- Big assignments could initially come with a plan of weekly tasks; semester two, students could create a plan for big assignments
- They wanted better and longer tutorials with question and answer and discussion sessions. These could possibly relate to assignments where applicable.

Other issues

- Some requested more workshop time
- Lack of crowd control in lectures and workshops made concentrating difficult for some.
- The change from working in very small groups in college and the highly structured way of doing things, to the large groups / lectures and freedom in HE was challenging. Several requested a slower change in teaching style.

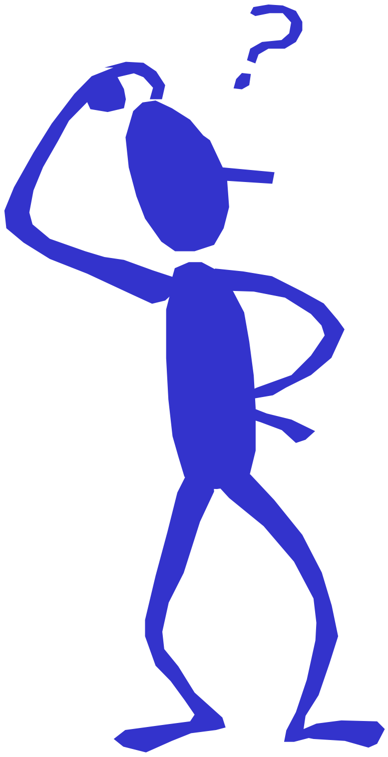
Positive points

- They like WOLF and on-line lecture notes
- They like the supportive staff and the relaxed environment

Appendix (vi)

'Supporting Students' handbook

Supporting students: the what, where and how for tutors.



A subjective review of information available to students requiring financial, personal or academic support.

2004-05, H. Bentley.

<u>(The numbered leaflets/booklets are in a pack in MU207)</u>

Contents

Page number

Glossary. Students' Union (SU); Student Services Gateway (SSG); Higher Education Shop (HES); University of Wolverhampton (UOW).

A. Financial support

Title	Comments
1. Student Loans (DfES)	36 page booklet with comprehensive information on student loans, repayments etc. New format, clear and well explained. Available from Students' Union (SU), Higher Education Shop (HES), Lichfield Street, and the Student Services Gateway (SSG) MB block.
2. Bridging The Gap (DfES)	48 page booklet with information on Disabled Students' Allowances. Large font size and question and answer format make this invaluable to disabled students and personal tutors. From SU, HES and SSG.
3. Financial Support for HE Students. Guide for 04/05. (DfES)	This 87 page booklet has a new format and is a comprehensive guide for students. Most things clearly explained in table form. Essential guide for personal tutors. From SU, HES and SSG.
4. Childcare Grant and other Financial Help for Student Parents in HE in 2004/2005 (DfES)	36 page booklet that details all the financial help available to students with children. Well laid out with a worked example that students may be able to relate to. From SU, HES and SSG.
5. Child Tax Credit and Working Tax Credit (Inland Revenue).	9 page booklet, question and answer format with examples given. Clearly explained. From SU.
6. Your Guide to Money Matters 2004 (UOW)	4 page leaflet with a useful brief outline of all money matters including local availability. From SU, HES and SSG

7. European Money for University of Wolverhampton Students (UOW)	A flyer explaining how local students may apply for funding (bursaries) from the European Social Fund. From SU, SSG and HES or visit www.wlv.ac.uk/money4students
8. Excellence Scholarships (UOW)	4 page leaflet explaining how to apply for scholarships that reward excellence. From SU, SSG and HES.
9. The Advice and Support Centre (SU)	3 fold leaflet that explains how the SU can offer help and advice on debts and dealing with creditors. From SU or visit www.wolvesunion.org/asc
10. How to get Financial Help as a Student. (DfES)	15 page booklet that covers all aspects of student finance but may be best for those applying for next year. From HES.
11. Student Services Gateway (UOW)	Flyer outlining the Gateway services including the Financial Support Unit. Visit www.wlv.ac.uk/money4students

B. Housing.

12. Home Stamp, the Free Guide to Renting Private Property (Homestamp)	34 pages of excellent and comprehensive advice on your rights and responsibilities, plus a safety checklist. Invaluable, I would give this booklet 5 stars. From SU.

13. Assured and Assured Shorthold Tenancies (Office of Deputy PM.	50 page booklet explaining tenancy agreements in detail. Question and answer format. From SU, HES and SSG.
14. Help with your Rent (DfWP)	6 sheet leaflet explaining how to claim housing benefit and some other housing costs. From SU, HES and SSG.

C. Personal Problems.

15. Student Services Gateway (UOW)	Flyer outlining the Gateway services including the Personal Counselling service. From SU and SSG. Tel (32)1020 or visit www.wlv.ac.uk/counsellingservices
16. Student Counselling Services Workshops (UOW)	Flyer with timetable of workshops e.g. managing stress; handling anger; motivating yourself etc. Detailed in attached pages*. From SU and SSG. To book places tel. (32)2572 or visit www.wlv.ac.uk/counsellingservices
17. Advice and Support Centre (SU)	Flyer, outlining the SU support services, which include personal and international specialist advice. From SU or visit www.wolvesunion.org/asc
18. The University Student Voice System (SU)	6 page leaflet that defines the role of student reps and the issues they face. From SU or visit www.wolvesunion.org/voice
18a A Guide for Staff (UOW)	**NOT** for students; this 4 page guide may help staff support students through personal problems.

D. Miscellaneous.

19. Stay Safe at Home (DTI)	16 page booklet full of good advice on domestic safety including first aid. From SU
20. Student Survival Guide (Home Office)	18 unnumbered pages of sound advice and sensible ways to survive the social and domestic aspects of student life. Includes drinking, drugs, theft etc. From SU.
21. What You Need to Know (DfES)	3 fold leaflet in question and answer format that covers all aspects of international students working in the UK, hours, permits, visas etc. From SU.
22. Fire Safety in the Home (DfT)	14 unnumbered pages of practical advice on what to do in the event of a fire. Also covers fire prevention. From SU.
23. Working Together Safely (CORGI)	3 fold leaflet; probably essential reading for students in accommodation with gas appliances. From SU.
24. Top 10 Crime Reduction Tips for Students (Good2Bsecure)	3 fold leaflet of simple but effective ways to stay safe. From SU.
25. Careers Advice (UOW)	3 fold leaflet on the help available from Careers Advice. Impartial, qualified advisors at drop-in sessions or for appointments. Help with CVs, interviews etc. From SSG or visit www.wlv.ac.uk/careers

26. Need Free Expert Advice? (Wolverhampton Council)	3 fold leaflet full of telephone numbers that may be useful e.g. local council depts. Inland revenue, benefits agency etc. From SU.

E. Academic Support.

27. Help is at Hand (SU)	The SU offer a range of short courses, called DOT sessions, mostly based on key skills, computing, study and life management skills. These are detailed in attached pages**. Tel. (32)2037 or visit www.wolvesunion.org/dot
28. Study Skills Tipsheets.	20 pages of very good advice on all aspects of studying, including punctuation, exams and essay writing. From learning Centre's web pages. http://asp.wlv.ac.uk/Level3.asp?Level3=542 Alternatively, Home Page ➔ Current Students ➔ Learning Centres ➔ Study Skills Guidance.
29. Referencing.	11 page guide to referencing from print and electronic sources. http://asp.wlv.ac.uk/Level5.asp?UserType=4&Level5=3165 Alternatively, Home ➔ Learning Centres ➔ Quick jump to ➔ Referencing.
30. Learning Centre.	IT help, 3rd floor; loans, reservations etc. Online renewals, Home ➔ current students ➔ OPAC library catalogue ➔ my account ➔ log in, or Tel 01902 321333 (distance services).

30. SCIT Student Support Centre	Programming, numeracy, communication and academic support for international students. Wednesdays, pm. Poster and timetable attached.
31. Study Skills Advisors.	Study skills advisors are available in the Learning Centre for sessions of up to 30 minutes. Enquire at help desk, or visit www.wlv.ac.uk/help follow 1-2-1 study advice links or book on-line http://asp.wlv.ac.uk/Form.asp?FormID=25&UserType=6

All DfES publications are available via freephone information line 0800 731 9133, also on DfES website http://www.dfes.gov.uk/studentsupport/

Please direct students to the "new students web page" where possible, there's lots of useful info there for them.

http://www.scit.wlv.ac.uk/~in7578/WELCOMEWEEK/Year1Page/index.htm

*Student Counselling Services Workshops 2004 – 2005

Session Title	Session Theme	Day	Date	Time	Site	Venue
'How to be yourself at University'	settling in to uni; self-confidence building	Wed	27 Oct	12.15 – 1.45 pm	C	HUB
'Do you know when enough is enough?'	awareness raising about alcohol/ drugs	Tues	9 Nov	12.15 – 1.45 pm	C	CS
'It's a Life/Work Balance…'	managing your time at uni	Tues	23 Nov	12.15 – 1.45 pm	C	HUB
'Managing Stress Levels in Academic Presentations for Students'	dealing with stress about presenting work	Wed Wed *Wed* *Tues*	24 Nov 1 Dec 1 Dec 7 Dec	12.15 – 1.45 pm 12.15 - 1.45 pm 1 – 2.30 pm 12.15 – 1.45 pm	Cp T W C	CL012 SC041 WT105 *HUB*
'Chill Out and Relax'	relaxation session	Wed	12 Jan	12.15 – 1.45 pm	C	CS
'Motivating Yourself'	lack of motivation/procrastination	Wed	9 Feb	12.15 – 1.45 pm	C	CS
'Students' Survival Guide to Group Projects'	how to work in groups	Tue *Wed* *Wed* *Thur*	22 Feb 23 Feb 23 Feb 24 Feb	12.15 – 1.45 pm 12.15 – 1.45 pm 1 – 2.30 pm 12.15 – 1.45 pm	Cp T W C	CL012 SC041 *W105* *HUB*
'Managing Anger and Being Assertive'	handling anger; being assertive	Wed	9 Mar	12.15 – 1.45 pm	C	CS
'Letting Go and Moving On'	coming to the end of the academic year	Thur	14 Apr	12.15 – 1.45 pm	C	CS
'Don't Stress! How to Cope with Revision and Exam Anxiety'	coping with the stress of exams	Tues Tues *Wed* Wed	26 Apr 26 Apr 27 Apr 27 Apr	12.15 – 1.45 pm 12.15 – 1.45 pm 1 – 2.30 pm 12.15 – 1.45 pm	Cp C W *T*	CL012 HUB WT105 SC041
'Chill Out and Relax Session'	relaxation session	Thur	12 May	12.15 – 1.45 pm	C	CS

As spaces on these workshops are limited, to book a place, please ring 01902 322572 or email ***counsellingservices@wlv.ac.uk***

For any further information about what Student Counselling Services offers, including personal counselling, please give us a ring, or see our website at www.wlv.ac.uk/counsellingservices

Key: C = City Campus; Cp = Compton Campus; T = Telford Campus; W = Walsall Campus; CS = Counselling Services, Student Services Gateway; HUB = Student Activities HUB, Students' Union.

**DEVELOPMENT, OPPORTUNITIES AND TRAINING (DOT) TIMETABLE 2004/05

SESSION	DAY	DATE	TIME	SITE	VENUE
I.T Doesn't Bite A Basic session looking at Word, Email and the Internet	MON TUES FRI MON TUES FRI MON	4TH OCT 5TH OCT 8TH OCT 11TH OCT 12TH OCT 15TH OCT 18TH OCT	2 – 4pm 2 – 4pm 2 – 4pm 4 – 6pm 4 – 6pm 2 – 4pm 10am-12pm	C T W C T W C	MD212B SA067 TBC MD212B SA067 TBC MD212B
How To Study Note Taking, Essay writing, Referencing and Plagiarism	MON TUES FRI MON TUES FRI	25TH OCT 26TH OCT 29TH OCT 1ST NOV 2ND NOV 5TH NOV	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm 4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W C T W	HUB SC041 WT213 HUB SC041 WT213
Communication Skills How to communicate effectively	MON TUES FRI	8TH NOV 9TH NOV 12TH NOV	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC041 WT213
Presentation Skills Tips and tricks on winning presentations	MON TUES FRI	15TH NOV 16TH NOV 19TH NOV	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC213 WT213
Teamwork Skills How to be a winning team	MON TUES FRI	22ND NOV 23RD NOV 26TH NOV	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC213 WT213
Leadership Skills Effective leadership skills	MON TUES FRI	29TH NOV 30TH NOV 3RD DEC	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC041 WT213
Assertiveness Skills Assertiveness tips and skills	MON TUES FRI	6TH DEC 7TH DEC 10TH DEC	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC041 WT213
Revision Techniques Revision tips and techniques	MON TUES FRI	13TH DEC 14TH DEC 17TH DEC	2 – 3.30pm 2 – 3.30pm 2 – 3.30pm	C T W	HUB SC041 WT213
Communication Skills How to communicate effectively	MON TUES FRI	7TH FEB 8TH FEB 11TH FEB	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W	HUB SC208 WT308
Presentation Skills Tips and tricks on winning presentations	MON TUES FRI	14TH FEB 15TH FEB 18TH FEB	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W	HUB SC208 WT308
Teamwork Skills How to be a winning team	MON TUES FRI	21ST FEB 22ND FEB 25TH FEB	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W	HUB SC208 WT308
Leadership Skills Effective leadership skills	MON TUES FRI	28TH FEB 1ST MARCH 4TH MARCH	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W	HUB SC208 WT308
Assertiveness Skills Assertiveness tips and skills	MON TUES FRI	7TH MARCH 8TH MARCH 11TH MARCH	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm	C T W	HUB SC208 WT314

CHECK OUT: www.wolvesunion.org/dot FOR DETAILS OF SESSIONS IN THIS PERIOD					
Revision Techniques Revision tips and techniques	THURS THURS THURS FRI	21ST APRIL 28TH APRIL 5TH MAY 13TH MAY	4 – 5.30pm 4 – 5.30pm 2 – 3.30pm 2 – 3.30pm	C T W C	HUB SC039 WT309 HUB

TO BOOK ON A SESSION PLEASE RING: 01902 322037 EMAIL: HUB@WOLVESUNION.ORG

Sessions need a minimum of 4 people to run

Cancellations will be given 24hours notice by phone or text message

C = City Campus, Wolverhampton
W = Walsall
HUB = Student Activities HUB, City campus

TBC = To Be Confirmed
T = Telford

Useful telephone numbers

Student Services Gateway	01902 (32)1020
Students' Union	01902 (32)2037
Careers and Employment Services	01902 (32)1414
Chaplaincy	01902 (32)2904

Student Services *GATEWAY*

The ***Gateway*** – newly opened in 2002 – aims to supply a 'one-stop' solution for many student queries, questions and concerns. Conveniently located across the way from the Harrison Learning Centre and next to the new Millennium City building *Gateway* services include:

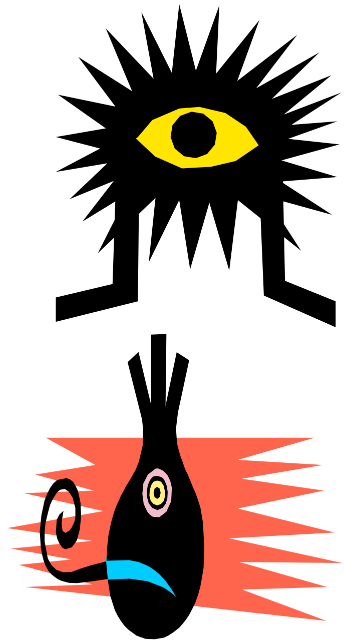
- An expert, friendly and approachable **reception** able to make appointments, offer information and give advice about the services available to you in the Gateway and nearby.
- Personal **counselling** services offering confidential and professional expertise and support when life gets difficult. Appointments may be booked in advance and a duty counsellor is usually available.
- The student **financial support** unit helps with enquiries and applications relating to most student finance issues and particularly with the hardship fund, hardship loan, bursary, scholarships and other government and University funds and schemes. Appointments can be booked in advance and may be available straightaway.
- The student enabling centre provides disability-related support services. 3 specialist units provide advice and support for **deaf, dyslexic and disabled students;** appointments are available and there is always someone on duty.
- The **career** development service and **jobshop** offer advice and guidance on employment on-course and on graduation – appointments are available and there is a duty adviser for 'quick queries'. There is a careers library, psychometric and computerised employer specific testing facilities and word processing and printing facilities for application preparation. CD ROM facilities, computer guidance systems and internet facilities can help you with your career planning and to allow you to view the latest vacancies and careers information available. Work experience opportunities and vacancy information is available to suit every need, whether you are an undergraduate looking for part time work now or something more long term on graduation. Regular employer presentations allow you to meet the recruiters of today and the careers education and development programme offers a range of workshops on the development of career management skills and students also have the opportunity of registering on an accredited programme of career development and learning.
- The **Graduate School** has a new home in the Gateway – staff there look forward to helping you develop your graduate skills and research expertise.

If you're not sure who to talk to or contact then make the *Gateway* your first port of call – *if we can't help you, we know someone who can*! Student Services Gateway; Ground Floor MB Building

SCIT Student Support Centre

Every Wednesday Afternoon

Struggling?



Worried?

Ask for help at these sessions…

Starting Wednesday 13th October

Programming Surgery	2pm - 4pm	MU404
Communication/Writing	2pm - 4pm	MT107
Numeracy/Maths	2pm - 4pm	***MU342***

Starting Wednesday 20th October

Academic English and Study Support for International Students	**2pm - 3pm drop-in in room MU331**
	3pm - 4pm more structured session in MU340

Appendix (vii)

Assessment survey

Assessment Survey

Before starting with this questionnaire, please read all the questions. Choose a course from those you teach from which you believe completing students progress to Higher Education. Please answer all questions with respect to only that course. If you teach another course that require different answers, feel free to complete the questionnaire again. For questions that use checkboxes please tick all boxes that apply.

Course Details

Institution:	
Qualification being studied. e.g. AVCE Comp.:	
Units/modules you teach. e.g. database design:	
Duration of each unit/module:	

1 **What assessment methods do you use? Please tick all that apply.**

	Used formatively	Used summatively
Exams: seen	☐	☐
Exams: unseen open book	☐	☐
Exams: unseen closed book	☐	☐
Exams: other	☐	☐
Multiple-choice tests	☐	☐
Short answer tests	☐	☐
Computer-based assessments	☐	☐
Logs/diaries	☐	☐
Portfolios	☐	☐
Assignments	☐	☐
Oral presentations to group	☐	☐
Oral presentations to staff	☐	☐
Other	☐	☐

Details of other

2 **What are the time scales of assignments? Tick more than one category if you use a mixture.**

	Individual	Group
Frequent (less than one week) tasks	☐	☐
Weekly tasks	☐	☐
Larger tasks	☐	☐

3 **How much support do students get with assessments?**

☐ Assessments can be completed entirely during taught sessions.

☐ Assessments can be partially completed during taught sessions.
☐ Students are reminded of deadlines.
☐ Tasks are broken into small parts and submitted at interim times.
☐ Other
Details of other

4 **What is your assessment deadline policy?**

☐ There is an institutional policy that is strictly applied.
☐ Late work is never accepted.
☐ Late work attracts a fixed penalty.
☐ Late work attracts a penalty that relates to how late it is.
☐ Other
Details of other

5 **What is your coursework resubmission policy?**

☐ Resubmission is not allowed.
☐ Work can be resubmitted until the students achieves they grade they want?
☐ Students are given feedback about what they need to do to improve their grade.
☐ For work that is to be considered for resubmission little feedback is give to the student.
☐ Are students given feedback at interim stages throughout an assessment.
☐ Other
Details of other

6 **To what extent do you experience problems with plagiarism, collusion and cheating?**
- How many cases do you usually identify on this module/unit?
- What are the penalties for those caught?
- Do students know what the penalties are?
- Is there an institutional policy regarding academic misconduct?

7 **Please comment on the following.**
- Do you think that the assessment strategies you use prepare students well for Higher Education.
- In what ways do they help?

- What do you think are the areas of weakness?

8 If would like to offer any other feedback, please include it here.

Finish

Appendix (viii)

Welcome Week survey

Welcome Challenge

One of the first activities that your were invited to participate in at University was the Welcome Challenge. The survey below asks questions that are aimed at gauging its success with the intention of improving it for the future.

As well as answering the multiple choice parts, you may include further comments in the text boxes provided.

The survey results are recorded anonymously, maintaining the secrecy of your identity. i.e. there is no way of tracing the replies you make back to you.

Did you participate in the Welcome Challenge?

- Yes
- No

Start

Welcome Challenge

Summarise the reasons why you did not participate or contribute.

>>

Welcome Challenge

Not including you, how many other people contributed to your team's work?

- 0
- 1
- 2
- 3
- 4

Comments:

>>

Welcome Challenge

Did you enjoy the welcome challenge?

- Yes
- No

Comments:

>>

Welcome Challenge

Did it help you learn about the facilities and resources available to you?

- Yes
- No

Comments:

>>

Welcome Challenge

Did it help you with your confidence? e.g. as a result of the experience would you be more confident about making presentations?

- Yes
- No

Comments:

>>

Welcome Challenge

Did it help build your team-working skills?

- Yes
- No

Comments:

>>

Welcome Challenge

Did it help you to get to know some of the staff?

- Yes
- No

Comments:

>>

Welcome Challenge

What would you do to make it better next year?

Finish

Welcome Challenge

Thankyou for participating in this survey. Your viewpoints are valued and will be considered when designing future events.

Appendix (ix)

Results of Welcome Week survey

Report: Welcome Challenge Survey

188 responses

1	Did you participate in the Welcome Challenge?	Count	Ratio
Yes		95	51.35%
No		90	48.65%
	Average	1.49	N/A
	Total selections	185	N/A
	Total Responses	185	

3	Not including you, how many other people contributed to your team's work?	Count	Ratio
0		13	16.67%
1		17	21.79%
2		29	37.18%
3		14	17.95%
4		5	6.41%
	Average	2.76	N/A
	Total selections	78	N/A
	Total Responses	78	

4	Did you enjoy the welcome challenge?	Count	Ratio
Yes		48	64%
No		27	36%
	Average	1.36	N/A
	Total selections	75	N/A
	Total Responses	75	

5	Did it help you learn about the facilities and resources available to you?	Count	Ratio
Yes		45	61.64%
No		28	38.36%
	Average	1.38	N/A
	Total selections	73	N/A
	Total Responses	73	

6	Did it help you with your confidence? e.g. as a result of the experience would you be more confident about making presentations?	Count	Ratio
Yes		30	42.86%
No		40	57.14%
	Average	1.57	N/A
	Total selections	70	N/A
	Total Responses	70	

7	Did it help build your team-working skills?	Count	Ratio
Yes		36	50.7%
No		35	49.3%
	Average	1.49	N/A
	Total selections	71	N/A
	Total Responses	71	

8	Did it help you to get to know some of the staff?	Count	Ratio
Yes		40	56.34%
No		31	43.66%
	Average	1.44	N/A
	Total selections	71	N/A
	Total Responses	71	

Welcome Challenge Survey - Comment report

2. Summarise the reasons why you did not participate or contribute.

17908: Unable to attend welcome week due to illness so I was unaware to take part.

17992: I arrived two weeks late for the opening of the semester.

17994: I missed my first week because I was still moving into Telford, then I missed the second week as I was lost, in my schedule CP1068 is scheduled in MI214, but it isn't.My third week was my first session.

18010: was not informed well.

18049: staff

18077: The idea to place me with people I had not met before, was a good idea in theory, but in practice, I still do not even know who was in my group. Perhaps if effort was made to place groups of two pairs of friends, so the participant will know at least one person, and have no reason not to enter

18081: My team mates were not too my liking

18087: My group didnt know nothing about HTML, and I didnt wanna do the work myself. Plus the other members werent to bothered with the activity so i did not bother to participate either.

18089: because i had some issues to the start of my first year semester where by i did not attend

18095: Have no idea what it is - was not told about it.

18099: attended first 3 days had work commitments that i could not get out of on the Thursday and the Friday. The other problem was that i never had e-mail replys fron the other learners in my team

18102: I wasn't at the university at the time, because I had a knee problem

18106: it just happen

18107: There were no girls in my group and I could not find my group members

18110: I couldnt find my group. Wasnt given any contact details of them.

18114: i was ill

18123: i didn't know about it

18131: Joint honours student, wasn't offered chance.

18132: Assigned group members were not interested, 2 of which were not even present,

18174: I did not see the goal of receiving a palm-pc as either achievable or desirable.

18205: I transfered from HND Computing, to this course during the second week.

18265: Wasn't really aware of it. Assumed I didn't need to, I'm a returning part time student in my 3rd year.

18291: I did not like the atmosphere

18307: I wasn't aware that it had took place

18373: ???

18399: i couldnt find my team members

18400: Could not find team members

18401: i could not find team members

18404: Members of my team did not turn up. I wasn't sure if my website would be good enough so did not hand it in.

18412: I have little/no experience in web design, and the rest of my assigned group never appeared, meaning that I had extremely minimal chances of succeeding by myself.

18416: I could not find any of my group members. I was also busy with enrolling , making my student ID card and NUS card and also familiarising myself with the place as am from out of town.

18417: i did'nt participate in this because i found it very hard to contact my group memebers and also not knowing who they are and what they look like

18418: A family death meant I missed the challenge

18420: The group which i was allocated for doing the challenge, could not be found.

18422: Did not come round to doing it

18424: Enrolled late started a course in manchester found out that the course was not to my liking so came home and came to Wolverhampton

18425: i don't have time to do all the questions, as my family are staying with me at the beginning, and i spent most of my time with them.

18427: i couldnt find the group i was meant to be in.

18428: I trasnferred to this university on week 3 so i did not be able to participate in the challenge.

18432: My group made a token effort to participate in the challenge, but it was only possible to remain in contact with only one other member of the group.

18434: no real reason to. Found it more valuable to set the town etc.

18448: I have no experience in web page design and couldnt really get hold of my group. I gave the challenge a go but could not get anywhere with it.

18482: I did not take part in the welcome week challenge because i had a few job interviews at the times when i was timetables in to do the team challenge

18485: I didn't participate in the challenge as I thought that although the prize was a good incentive to participate, I hadt been introduced to my group prior. Also in past experience although it is meant to be a group task the majority of groups would find the most skilled person for the task and then give very little input from others left them to do it.

18486: Could not get there.

18489: making a website for new students when i am a new student myself is quite silly as i do not know anything about the university.

also the only time i have made website before was by using dreamweaver and so i had little idea on how to make websites.

the group i was put with to complete the task did not turn up to the welcome week and so it was me on my own who didnt know how to use the website making software ad had little idea on the topic material.

18502: The buildings moved from MU to MI, the Web Computing degree program for February starters last year was in rather a lot of chaos, which meant the first week was spent in it's entirity getting the exacts about timetable. I trust this will be taken confidentially. I would have liked to participate otherwise, as I'm quite keen and hard working.

18506: Well i could not find the rest of team members to participate in the challenge.

18507: I was on a different course.

18511: no time

18513: I came in a week late....

18514: daint know anything about it

18517: did not know about it, its seems boring as well. and u can do with making lecturs more intresting.

18521: I was abroad

18523: Did not arrive in the UK until October 08th 2005.

18524: I was not around.

18583: NOt aware of the Challenge

18600: forgot

3. Not including you, how many other people contributed to your team's work?

1 0
2 1
3 2
4 3
5 4

18002: Not much help from the rest of team at all. 95% done by me.

18005: Barely anybody turned up in my group and the one who did, only turned up for the first day. Pretty dissapointing.

18034: Could have helped a great deal more than they did.

18050: staff

18076: I Was the only 1.... te groups were not taught how to use the computer system befor they were sent away so my group didn't know how to read their email, the only point of contact.. not compulsary.... cuould have done with being a simpler task (A treasur hunt was discussed) that would make us explore the computer system as a team!

18082: i mostly did all the work

18083: No real way of getting hold of the rest of your group if they were not in the lecture where groups are assigned.

18090: We could not find the 4th member.

18091: I had to do all the work MYSELF
It was like i was left in a desert by myself, and had to find my way back to land, without no one being there for HELP

18097: The other 2 never turned..up.

18100: We couldn't contact 1 of them and the other didn't turn up

18116: I had to join people in other groups to make a reasonable size team. This is because I couldn't contact the other members of my team.

18120: The other person did not turn up on the day that the teams were allocated, therefore we could not contact him.

18122: I could only find one person in my group on the first day, but she didn't help at all and never turned up to the presentation of the work and never showed up the day before either. Found another one of my group on the day of the presentation but that was no good then as I had already done most the work anyway. I think the groups were poorly organised and we should have been gathered in the lecture hall in the MC building and asked to stand up a group at a time, this way everyone would have known what group they were in instead of having to wonder round asking random people if you were part of thier group.

18124: hard to get in touch with other group members

18293: They didn't give much effort....

18410: One turned up late however all contributed

18411: Only saw my team on the first day. Could not find them for the rest of the week. I was the only one who turned up on the friday.

18413: One turned up on the last day, one didn't even turn up at all.

18431: One other persom i found wasn't bothered. Due to possible timetabling not all of my group were in a classroom at the same time, this then created additional promblem of having to contact them. The other two might not of even turned up for some of the first week.

18443: One turned up late and one not at all, but everybody that appeared contributed

18446: jgjhk

18447: they are great, they do most of the work

18488: My teams members never showed up

18495: couldn't find my other team mates, didn't turn up.

18496: i didnt like the presentation part

18512: could not find group members untill final day, ny then the website was created

4. Did you enjoy the welcome challenge?

1 Yes
2 No

17995: It was a good idea, but because not everyone turned up or some groups had no one to work with, it was really pointless as some people in some groups may have not done anything on computers, so it was basicly unbalanced

18002: Yes as i have made websites before

18034: Fantastic fun, especially on the day with the shock winner!

18050: yes

18076: Allowed us to mingle with new people within the computer rooms, the food was a bit of a disaster on the 1st day. A wider selection of Buffet food would have being nice and Pre Warning Before hand that we were going to be fed for FREE...!

18082: yes but i spent most of the time doing all the work but won nothing which is too bad.

18090: We did not have enought time.

18091: Yes and NO, Yes coz i won a Java book in the competition, NO because i had no help from my team members

18100: I only found my team the day before the challenge was due.

18120: 1 of the team members took complete control of the challenge and did not let myself or the other team member make ideas.

18122: Not really, would have enjoyed it had I had help and been able to find the rest of my group on the first day.

18293: No, because I did a group's work all by myself. Otherwise I found it a good thing.

18410: Refreshed my HTML knowledge, which was helpful for when I started the course.

18411: Spent too much time trying to get in contact with my team mates.

18413: It was enjoyable to think that there is a good price to be won but there was little help for people that had no idea of how to use HTML.

18419: it was an interesting event, and allowed me to make some good friends.

18423: On the whole yes, but I was not happy that we had to make a presentation about our website without being given chance to prepare.

18426: It was okay, it was good to meet new people.

18440: communication was awkward.
individual project may have been better.

18443: It was a decent challenge and put me in good stead for my HTML module.

18446: dghfh

18447: it is funny, but i had difficulties finding my teammates

18488: I won book

18491: Not being able to work with those who I had newly met and being forced to work with people where our team did not gel at all resulted in arguments and disputes all the way through

18492: personally i thought it was quite dull and disorganised

18495: get a chance to know other people

18496: it was a good way of mackin new friends

18498: i THINK IT WAS A WORTHWHILE BUT I HAVE NEVER USED FRONT PAGE B4 so not knowing what I was doing was strange

18509: To techniqual to do on my own, there was no or very little resources to make website. No one else bothered helping. The fact that we had to do a presentation was not metioned, I hate doing presentations.

18516: No Co-Operation

5. Did it help you learn about the facilities and resources available to you?

1 Yes
2 No

17995: No not really,

18002: a wide range were available

18050: yes

18076: I Struggled to navigate arround the systems dn was not able to do as i wished, ie, Printing, Email and knowing where the software i wanted was. Access to the MI building restricted the challange, but that was outside the control of the lecturers...

18090: No, most of the work was done at home.

18091: Can't say much , it did help alittle

18120: The learning centers were really god when doing the website.

18122: Not really, as we were told about these before the group work started anyway.

18410: Guided around most computer facilities adequately and quickly found where most buildings were.

18411: Generally this was quite good.

18413: I think it did as we got to use a few buildings and different rooms while making a website.

18419: but i would of liked a more formal tour of the facilities before hand.

18426: We didnt have entrance to the MI building for the first week, and some of our rooms we had to go in have been moved.

18443: Guided well around the computer facilities and learnt my way around campus relatively quickly.

18446: dfgg
18447: they did most of the things
18492: Because the main facilties we were supposed to use were not ready
18496: learnt about things available to me
18509: I did find out how to locate resources through the phones located through out the uni, but no one told me about that I had to find that out all by myself.

6. Did it help you with your confidence? e.g. as a result of the experience would you be more confident about making presentations?

1 Yes
2 No

17993: I guess it did in a way, because I'm not a person to be bold in doing presentations
18076: No... being on my iwn i can cope but it would have being nice to have the support in designing and prducing the HTML as it not 1 of my strong points compared to the other students...
18090: Not as much.
18091: Definatly, it was a challenge, coz i never presented in a cinema hall, (if u know what i mean) inc. a mike
18120: I did not present the website
18122: No
18124: Didnt get the chance to showo the presentaton
18293: Even though I could of made things better.
18411: I'm not very good at making presentations!
18413: Even though i didn't want to speak i was practically forced to do it so it helped me gain some confidence infront of new class mates.
18419: i didn't attend the presentation
18421: As i didn't attend for that day
18423: Being thrown in at the deep end has now made me less likely to want to do presentations as my memory of it is one of fear.
18426: I never liked presentations, never will.
18443: I hate presentations and being asked to do one in front of people I don't know never helps my confidence.
18446: gghh
18447: i didn't say much things
18483: I didn't like the presentation part
18492: i already have enough confidence so it didnt really improve anything
18495: im always shy in front of people and because i was on my own i did find it a litle scary
18498: In a way. Eventually I know i will have to present my work to a large group.
18509: I hate presentations, and as always im the defualt person to be made to do such tasks!
18512: a bit yes

7. Did it help build your team-working skills?

1 Yes
2 No

17993: No because I didnt work with anyone
18002: no teamworking happend at all
18076: Lack of teams, altogh the descution of the lack of teams creating a tem of 12 students that fought with the Designer of the induction week... for foughly 2 hours, Harmless but usefull Debate!
18090: Yes, we worked good as a team
18091: Coz i had no team to build my skills (VERY DESAPPOINTING)
18100: Didn't spend much time with the team
18120: I am used to working as a group but the team challenge did not seem like a group task.
18122: No but it might of had I been able to find all of my group.
18124: Though every member should have been present
18293: No, because it was a bad team from the start.
18411: Never saw my team!
18413: Not really as it was just two of us at the time and i am happy with how i work with a team anyway.
18421: Nope, didn't lean anything new
18443: As a team we built together a good base of information which was then implemented into the site.
18446: ghjh
18447: the nice gentlemen in my group treat me good
18481: it would have helped team-working skills if the whole group participated
18488: No team members to build team working skills
18492: we didnt really act like a team
18498: not sure
18509: WHAT TEAM!!!!!!!!!

8. Did it help you to get to know some of the staff?

1 Yes
2 No

17995: it help me meet differnt staff and which ones are helpful

18076: Staff were spread as much as the students were, especialy in the MU building, again, this was planned to be different if every1 was in the MI building....

18091: Alittle, not much was going on with staff, it was just head down and finishing the challenge before the deadline, which i did fantastically well

18116: The staff were a little difficult to get hold of.

18120: I did not communicate with the staff whilst making the website.

18122: Yes

18413: there were always staff around and they were often polite.

18419: we spent the majority of the time alone in our groups, which gave us little time to get to know the staff.

18421: As most of the work i done was at home

18423: Yes the staff were very helpful and it did help.

18443: But not many, most prominent were Arline Wilson, which is probably appropriate as she is the course leader, and my personal tutor Matthew Green.

18446: tyu

18447: i can recognise them

18492: we met many staff although at times some were not very helpful

18509: WHERE THE HELL WHERE THEY?

9. What would you do to make it better next year?

17889: If the students were allowed to pick a topic of their choice.

17995: In order to make it better, I would do a chanllage that basicly every1 can do, e.g. create a poster for the welcome week, this would be better as it gives everyone a equal chance to compete in the challage, and doesnt make it uneven. Were a before, their was alot of people that knew how to create a web page no problem, and then their was other that didnt have a clue, but ther's always space for improvement, I guess

18002: a closer look at the groups which we were seperated into would make it a better experience, possible choice of own groups.

18005: Perhaps make the challenge more flexible in the groups by allowing people to form groups if they have missing members for example?

18034: It would be better to ensure that team members chosen would actualy turn up to help in the challenge.

18075: BETTER PRIZE SOMAT LIKE A 2 WEEKS IN MAGALUF

18076: * Held in MI
* A simpler task making us use WOLF, HTML design, Graphics design, internet, Chat, Teacher resorces, SAFARI... and of the interactive resorces....
* Including a task where we would have to navigate to different sections of the Buildings and finding members of staff to sign items, or Hints on the walls to solve puzzles... make it lighter.... (Treasure Hunt....)
* Although the PDA prizes were good.... a Larger selection opf prizes for all members would have being better and a less expencive prize for 1st place so that every 1 felt involved with the tsk
* Making it compulsary
*Allowing us to choose our own groups with terms and conditions eg. 2 ppl on campus and 2 ppl off to mix up the groups but keep @ least 2 ppl 2gether that know each other...
* A more accessable Email List, or teaching the students how to search using the To.. button within WebOutlook!

Was enjoyable but next year will be better
And i still offer to help next year!

18079: provide more help

18082: at least people that mostly did all the hard work should also get something

18083: More organised system of getting groups together and allocating groups as to not leave some people on their own because other group members couldnt be bothered to show.

18086: more team building tasks......

18088: more fun

18090: Pick you own groups for the the group work and I dont have Students voting for the best out of all the groups because most of its fixed.

18091: I would get all the class together and give the students the oppurtunity to choose the team members themselves, coz they would likely know which student will be helpful and a willing team member.

i would also give them more advice and help on topics and more staff to be helpful and around to help each team.

Overall, for me it was a experience that would stay with me for a while. I mean by that is the presentation was abit hard to take ,coz i was alone presenting it by myself

18097: In all honesty, what you did this year really was quite good. I cant think of any improvments that you could make.

18100: Make it clear how to contact the other members of the team. At first you said you would put up a list of everybodys email you. this never materialised. So you then said to look up each others emails in the directory. So we lost about two days working time.

18101: Make it more challenging and interesting!

18111: make it more exciting

18116: The tutors need to be available more.

18118: The groups were a bit of a mess up. Perphaps instead of generating a pre-list, just assign groups by students on tables?

18120: Groups should be chosen by the students, this will improve the quality of the website, the remainding students can then be split into the remainding groups if they have not be chosen already.

The task should be explained in more detail so the students dont get lost or worried about what they have to do.

18122: Organise the groups better and make everyone go to the lecture hall in MC001 and make them stand up one group at a time so that everyone knows what groupthere are in.

18124: If the same activity happened get everyone to contact each other at an early stage so most of the time hasnt gone to waste and also choose different activities so that more staff are involved

18293: Group work is good. I like that and I would suggest to give a group work (since they'll probably be strangers to each other):
-set sections of work for each member, or
-set rules for a group(e.g. only Campus work valid), or
-percentage of each member's work(depending on their skill level), are a few things that could make things a little more smooth on everybody.

18294: Better Organisation and also making clear what the students are supposed to do and where to go.

18398: ?

18407: Better org of the teams

18411: Make sure that each team has the contact details of other team mates.

18413: Give help to those who need it with the HTML instead of leaving them on there own as they need confidence when going into a degree which they may not think they are good at. A little guide bok may have been a good idea as a starting block.

18419: 1> Provide a more formal tour of the facilities.

2> Don't bother with the "get to know eachother" session in the lecture room in MU block, I found it counter productive.

3> Give is more time together on the first day in the first tutorial time.

18421: A proper tour of the whole City Campus and more organisation as half of the students didn't know what they were supposed to do so they simply just went home. Also something more enjoyable e.g. sport or games competition should been done to see the abilties of all the students.

18423: Being warned about the presentation.

Change the judging system; there were some great websites but the judging failed to recognise the effort that those teams had put in. Maybe a prize awarded by the staff aswell as the students would be a good idea.

18426: Have a detailed booklet of the course and the names of teachers that we are going to be taught by, and about the facilities we will be using etc ..

18430: Instead of the quick "put up your hand if you're in group xx", give students a chance to actually meet their group mates, by other means, if possible.

18439:
I would inculde people that will stay in my group.

for example only 1 of the people that was in my team is actually in my class now.

he is my mate now if you manage to include eveyone in the group that will stay in the same groups for study it will help them settle in quicker.

18440: university should take a survey and find out people who WANT to participate. This enables the participating teams to create a project as a team. (option should be given to students)

18443: Ensure that all members of a group participate in the challenge

18446: fhgjyh

18450: Allow people to assign their own groups instead of having to contact people that do not answer

18481: some group members chose not to partake because they felt it was a waste of time since the website was not going to contribute towards any marks. If the website was marked and more time given, the challenge would have been more useful.

18483: More smaller prizes, maybe a little prize if you actually do it

18484: Put more prizes

18487: Have more meetings with the tutor and more activities where you get to know the students you will be studying with

18488: Better team organisations and eveyone should get a PDA or if you have to give books that were required for the course

18491: Allow Teams to be chosen, the majority of people will have met people recently and know who they get along better with.

18492: something completely different

18493: Ensure teams are put together (i.e. calling out numbers etc.) before starting the challenge to enable the team to get to know each other and help improve their teamwork.

List the resources available for the challege (i.e. FrontPage, DreamWeaver etc.).

18495: let tutors vote, students may form cliches and vote for a poor website!
18496: not alot
18498: Teach the students a little bit about using front-page
18503: Change the topic to somthing else.
18504: make it a bit more challaging
18509: Have a treasure hunt type of thing, with tasks which involve the use of reasources, and clues.
18519: Not set a challenge

Appendix (x)

Module leader's questionnaire

Questionnaire for Level 1 module leaders.

1. How long have you been module leader?
2. Did you work on the module before then?
3. Were there any changes made to the module between 2002/03 and 2003/04?
4. Have there been any changes since 2003/04?
5. If yes, what do you think the effects will be?
6. Would you change anything on the module if you could?
7. Are you happy with the assessment régime?
8. Are you happy with the student workload?
9. Are you happy with the staff workload?
10. Are you happy with the pass rate?
11. What is the attendance rate?
12. Have you noticed a difference in the students in the last 2 or 3 years?
13. Do you think students are well prepared for HE study?
14. Do you think any particular groups perform better than others?
15. Do you think students find this module challenging?
16. Is there anything you would like to do to improve student learning?
17. How could you improve student performance?
18. Will you be module leader next year?
19. How do you deliver feedback on this module?
20. What do you think are the possible effects of the move to the new building?
21. Do you have any other comments on this module?

Appendix (xi)

Statistical analyses for pilot study

1 One way ANOVA of students' conceptions of learning by entrance qualification (three groups)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AA	Between Groups	.302	2	.151	.155	.857
	Within Groups	68.219	70	.975		
	Total	68.521	72			
AB	Between Groups	5.468	2	2.734	4.687	.012
	Within Groups	41.411	71	.583		
	Total	46.878	73			
AC	Between Groups	.517	2	.259	.378	.686
	Within Groups	48.523	71	.683		
	Total	49.041	73			
AD	Between Groups	.355	2	.178	.330	.720
	Within Groups	38.185	71	.538		
	Total	38.541	73			
AE	Between Groups	.702	2	.351	.390	.679
	Within Groups	63.960	71	.901		
	Total	64.662	73			
AF	Between Groups	4.477	2	2.239	3.043	.054
	Within Groups	52.239	71	.736		
	Total	56.716	73			

<ins>2 *Post hoc* test results of comparison between entrance qualification groups for statement Ab</ins>

Multiple Comparisons
Bonferroni

Dependent Variable	(I) ent qual2	(J) ent qual2	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
AA	A levels	AVCE	-.14	.26	1.000	-.79	.50
		Other	-9.38E-02	.30	1.000	-.84	.65
	AVCE	A levels	.14	.26	1.000	-.50	.79
		Other	5.00E-02	.32	1.000	-.73	.83
	Other	A levels	9.38E-02	.30	1.000	-.65	.84
		AVCE	-5.00E-02	.32	1.000	-.83	.73
AB	A levels	AVCE	-.45	.20	.085	-.95	4.32E-02
		Other	-.65	.23	.021	-1.22	-7.54E-02
	AVCE	A levels	.45	.20	.085	-4.32E-02	.95
		Other	-.19	.24	1.000	-.79	.41
	Other	A levels	.65	.23	.021	7.54E-02	1.22
		AVCE	.19	.24	1.000	-.41	.79
AC	A levels	AVCE	1.33E-02	.22	1.000	-.52	.55
		Other	.21	.25	1.000	-.41	.83
	AVCE	A levels	-1.33E-02	.22	1.000	-.55	.52
		Other	.20	.26	1.000	-.45	.84
	Other	A levels	-.21	.25	1.000	-.83	.41
		AVCE	-.20	.26	1.000	-.84	.45
AD	A levels	AVCE	.15	.19	1.000	-.32	.63
		Other	2.27E-02	.22	1.000	-.53	.57
	AVCE	A levels	-.15	.19	1.000	-.63	.32
		Other	-.13	.23	1.000	-.71	.45
	Other	A levels	-2.27E-02	.22	1.000	-.57	.53
		AVCE	.13	.23	1.000	-.45	.71
AE	A levels	AVCE	-4.00E-02	.25	1.000	-.66	.58
		Other	-.25	.29	1.000	-.96	.46
	AVCE	A levels	4.00E-02	.25	1.000	-.58	.66
		Other	-.21	.30	1.000	-.96	.54
	Other	A levels	.25	.29	1.000	-.46	.96
		AVCE	.21	.30	1.000	-.54	.96
AF	A levels	AVCE	-.23	.23	.921	-.79	.32
		Other	-.64	.26	.048	-1.28	-3.21E-03
	AVCE	A levels	.23	.23	.921	-.32	.79
		Other	-.41	.27	.420	-1.08	.26
	Other	A levels	.64	.26	.048	3.21E-03	1.28
		AVCE	.41	.27	.420	-.26	1.08

* The mean difference is significant at the .05 level.

3 Mean scores of groups by entrance qualification for statement Ab on ASSIST questionnaire

Descriptives

	ent qual			Statistic	Std. Error
AB	A levels	Mean		3.67	.14
		95% Confidence Interval for Mean	Lower Bound	3.38	
			Upper Bound	3.96	
		5% Trimmed Mean		3.69	
		Median		4.00	
		Variance		.667	
		Std. Deviation		.82	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		1.00	
		Skewness		-.027	.409
		Kurtosis		-.438	.798
	AVCE	Mean		4.12	.15
		95% Confidence Interval for Mean	Lower Bound	3.82	
			Upper Bound	4.42	
		5% Trimmed Mean		4.13	
		Median		4.00	
		Variance		.527	
		Std. Deviation		.73	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.00	
		Skewness		-.189	.464
		Kurtosis		-.971	.902
	GNVQ	Mean		4.00	.27
		95% Confidence Interval for Mean	Lower Bound	3.37	
			Upper Bound	4.63	
		5% Trimmed Mean		4.00	
		Median		4.00	
		Variance		.571	
		Std. Deviation		.76	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.50	
		Skewness		.000	.752
		Kurtosis		-.700	1.481
	BTEC	Mean		4.75	.25
		95% Confidence Interval for Mean	Lower Bound	3.95	
			Upper Bound	5.55	
		5% Trimmed Mean		4.78	
		Median		5.00	
		Variance		.250	
		Std. Deviation		.50	
		Minimum		4	
		Maximum		5	
		Range		1	
		Interquartile Range		.75	
		Skewness		-2.000	1.014
		Kurtosis		4.000	2.619
	Overseas	Mean		4.50	.50
		95% Confidence Interval for Mean	Lower Bound	-1.85	
			Upper Bound	10.85	
		5% Trimmed Mean		.	
		Median		4.50	
		Variance		.500	
		Std. Deviation		.71	
		Minimum		4	
		Maximum		5	
		Range		1	
		Interquartile Range		.	
		Skewness		.	.
		Kurtosis		.	.
	HNC	Mean		4.50	.50
		95% Confidence Interval for Mean	Lower Bound	-1.85	
			Upper Bound	10.85	
		5% Trimmed Mean		.	
		Median		4.50	
		Variance		.500	
		Std. Deviation		.71	
		Minimum		4	
		Maximum		5	
		Range		1	
		Interquartile Range		.	
		Skewness		.	.
		Kurtosis		.	.

4 Mean ages of students by entrance qualification

Descriptives

	ent qual			Statistic	Std. Error
age	A levels	Mean		19.09	.50
		95% Confidence Interval for Mean	Lower Bound	18.07	
			Upper Bound	20.11	
		5% Trimmed Mean		18.59	
		Median		18.00	
		Variance		8.335	
		Std. Deviation		2.89	
		Minimum		18	
		Maximum		34	
		Range		16	
		Interquartile Range		1.00	
		Skewness		4.615	.409
		Kurtosis		23.604	.798
	AVCE	Mean		18.64	.14
		95% Confidence Interval for Mean	Lower Bound	18.35	
			Upper Bound	18.93	
		5% Trimmed Mean		18.60	
		Median		19.00	
		Variance		.490	
		Std. Deviation		.70	
		Minimum		18	
		Maximum		20	
		Range		2	
		Interquartile Range		1.00	
		Skewness		.643	.464
		Kurtosis		-.641	.902
	GNVQ	Mean		20.00	.82
		95% Confidence Interval for Mean	Lower Bound	18.05	
			Upper Bound	21.95	
		5% Trimmed Mean		19.89	
		Median		19.50	
		Variance		5.429	
		Std. Deviation		2.33	
		Minimum		18	
		Maximum		24	
		Range		6	
		Interquartile Range		4.25	
		Skewness		.994	.752
		Kurtosis		-.409	1.481
	BTEC	Mean		24.50	5.20
		95% Confidence Interval for Mean	Lower Bound	7.94	
			Upper Bound	41.06	
		5% Trimmed Mean		24.00	
		Median		20.00	
		Variance		108.333	
		Std. Deviation		10.41	
		Minimum		18	
		Maximum		40	
		Range		22	
		Interquartile Range		17.00	
		Skewness		1.916	1.014
		Kurtosis		3.703	2.619
	Overseas	Mean		26.50	.50
		95% Confidence Interval for Mean	Lower Bound	20.15	
			Upper Bound	32.85	
		5% Trimmed Mean		.	
		Median		26.50	
		Variance		.500	
		Std. Deviation		.71	
		Minimum		26	
		Maximum		27	
		Range		1	
		Interquartile Range		.	
		Skewness		.	.
		Kurtosis		.	.
	HNC	Mean		30.00	7.00
		95% Confidence Interval for Mean	Lower Bound	-58.94	
			Upper Bound	118.94	
		5% Trimmed Mean		.	
		Median		30.00	
		Variance		98.000	
		Std. Deviation		9.90	
		Minimum		23	
		Maximum		37	
		Range		14	
		Interquartile Range		.	
		Skewness		.	.
		Kurtosis		.	.

5 Results of one way ANOVA of students' preferences for different types of course and teaching by maturity

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
CA	Between Groups	2.035E-02	1	2.035E-02	.021	.886
	Within Groups	82.875	84	.987		
	Total	82.895	85			
CB	Between Groups	1.123	1	1.123	1.580	.212
	Within Groups	59.714	84	.711		
	Total	60.837	85			
CC	Between Groups	.130	1	.130	.140	.709
	Within Groups	77.510	84	.923		
	Total	77.640	85			
CD	Between Groups	3.095	1	3.095	3.251	.075
	Within Groups	79.986	84	.952		
	Total	83.081	85			
CE	Between Groups	1.181	1	1.181	1.007	.319
	Within Groups	98.540	84	1.173		
	Total	99.721	85			
CF	Between Groups	2.357	1	2.357	4.213	.043
	Within Groups	46.992	84	.559		
	Total	49.349	85			
CG	Between Groups	1.334	1	1.334	1.464	.230
	Within Groups	76.492	84	.911		
	Total	77.826	85			
CH	Between Groups	2.295	1	2.295	2.325	.131
	Within Groups	82.915	84	.987		
	Total	85.209	85			
CI	Between Groups	3.167	1	3.167	4.961	.029
	Within Groups	53.635	84	.639		
	Total	56.802	85			

6 Scores on statements Ca – Ci on ASSIST questionnaire by maturity

Descriptives

	maturity			Statistic	Std. Error
CA	under 21	Mean		4.04	.12
		95% Confidence Interval for Mean	Lower Bound	3.81	
			Upper Bound	4.28	
		5% Trimmed Mean		4.13	
		Median		4.00	
		Variance		.998	
		Std. Deviation		1.00	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.75	
		Skewness		-1.044	.283
		Kurtosis		.902	.559
	21 plus	Mean		4.00	.26
		95% Confidence Interval for Mean	Lower Bound	3.45	
			Upper Bound	4.55	
		5% Trimmed Mean		4.06	
		Median		4.00	
		Variance		.923	
		Std. Deviation		.96	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		2.00	
		Skewness		-.607	.597
		Kurtosis		-.394	1.154
CB	under 21	Mean		3.83	9.89E-02
		95% Confidence Interval for Mean	Lower Bound	3.64	
			Upper Bound	4.03	
		5% Trimmed Mean		3.85	
		Median		4.00	
		Variance		.704	
		Std. Deviation		.84	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		-.261	.283
		Kurtosis		.222	.559
	21 plus	Mean		4.14	.23
		95% Confidence Interval for Mean	Lower Bound	3.64	
			Upper Bound	4.64	
		5% Trimmed Mean		4.16	
		Median		4.00	
		Variance		.747	
		Std. Deviation		.86	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		2.00	
		Skewness		-.306	.597
		Kurtosis		-1.635	1.154

Descriptives

	maturity			Statistic	Std. Error
CC	under 21	Mean		3.82	.11
		95% Confidence Interval for Mean	Lower Bound	3.61	
			Upper Bound	4.03	
		5% Trimmed Mean		3.85	
		Median		4.00	
		Variance		.826	
		Std. Deviation		.91	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		2.00	
		Skewness		-.093	.283
		Kurtosis		-1.020	.559
	21 plus	Mean		3.71	.32
		95% Confidence Interval for Mean	Lower Bound	3.02	
			Upper Bound	4.41	
		5% Trimmed Mean		3.74	
		Median		3.00	
		Variance		1.451	
		Std. Deviation		1.20	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		2.00	
		Skewness		.025	.597
		Kurtosis		-1.792	1.154
CD	under 21	Mean		3.49	.12
		95% Confidence Interval for Mean	Lower Bound	3.25	
			Upper Bound	3.72	
		5% Trimmed Mean		3.52	
		Median		3.00	
		Variance		.986	
		Std. Deviation		.99	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		-.138	.283
		Kurtosis		-.262	.559
	21 plus	Mean		4.00	.23
		95% Confidence Interval for Mean	Lower Bound	3.49	
			Upper Bound	4.51	
		5% Trimmed Mean		4.00	
		Median		4.00	
		Variance		.769	
		Std. Deviation		.88	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		2.00	
		Skewness		.000	.597
		Kurtosis		-1.773	1.154

Descriptives

	maturity			Statistic	Std. Error
CE	under 21	Mean		3.89	.13
		95% Confidence Interval for Mean	Lower Bound	3.64	
			Upper Bound	4.14	
		5% Trimmed Mean		3.96	
		Median		4.00	
		Variance		1.142	
		Std. Deviation		1.07	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.00	
		Skewness		-.627	.283
		Kurtosis		-.260	.559
	21 plus	Mean		3.57	.31
		95% Confidence Interval for Mean	Lower Bound	2.90	
			Upper Bound	4.24	
		5% Trimmed Mean		3.63	
		Median		4.00	
		Variance		1.341	
		Std. Deviation		1.16	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.25	
		Skewness		-.722	.597
		Kurtosis		.442	1.154
CF	under 21	Mean		4.31	8.54E-02
		95% Confidence Interval for Mean	Lower Bound	4.14	
			Upper Bound	4.48	
		5% Trimmed Mean		4.35	
		Median		4.00	
		Variance		.525	
		Std. Deviation		.72	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		1.00	
		Skewness		-.770	.283
		Kurtosis		.161	.559
	21 plus	Mean		3.86	.23
		95% Confidence Interval for Mean	Lower Bound	3.36	
			Upper Bound	4.36	
		5% Trimmed Mean		3.84	
		Median		4.00	
		Variance		.747	
		Std. Deviation		.86	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		2.00	
		Skewness		.306	.597
		Kurtosis		-1.635	1.154

Descriptives

	maturity			Statistic	Std. Error
CG	under 21	Mean		3.31	.12
		95% Confidence Interval for Mean	Lower Bound	3.07	
			Upper Bound	3.54	
		5% Trimmed Mean		3.31	
		Median		3.00	
		Variance		.976	
		Std. Deviation		.99	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		.067	.283
		Kurtosis		-.312	.559
	21 plus	Mean		3.64	.20
		95% Confidence Interval for Mean	Lower Bound	3.21	
			Upper Bound	4.07	
		5% Trimmed Mean		3.60	
		Median		3.50	
		Variance		.555	
		Std. Deviation		.74	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.00	
		Skewness		.731	.597
		Kurtosis		-.637	1.154
CH	under 21	Mean		3.49	.12
		95% Confidence Interval for Mean	Lower Bound	3.25	
			Upper Bound	3.72	
		5% Trimmed Mean		3.52	
		Median		3.00	
		Variance		.986	
		Std. Deviation		.99	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		.039	.283
		Kurtosis		-.251	.559
	21 plus	Mean		3.93	.27
		95% Confidence Interval for Mean	Lower Bound	3.35	
			Upper Bound	4.50	
		5% Trimmed Mean		3.98	
		Median		4.00	
		Variance		.995	
		Std. Deviation		1.00	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		2.00	
		Skewness		-.382	.597
		Kurtosis		-.946	1.154

Descriptives

	maturity			Statistic	Std. Error
CI	under 21	Mean		4.31	8.99E-02
		95% Confidence Interval for Mean	Lower Bound	4.13	
			Upper Bound	4.48	
		5% Trimmed Mean		4.34	
		Median		4.00	
		Variance		.581	
		Std. Deviation		.76	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.00	
		Skewness		-.585	.283
		Kurtosis		-1.040	.559
	21 plus	Mean		3.79	.26
		95% Confidence Interval for Mean	Lower Bound	3.22	
			Upper Bound	4.35	
		5% Trimmed Mean		3.82	
		Median		4.00	
		Variance		.951	
		Std. Deviation		.97	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		2.00	
		Skewness		-.089	.597
		Kurtosis		-1.027	1.154

7 Results for module CP1061 by previous institution

ANOVA

CP1061

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	93.272	4	23.318	4.685	.002
Within Groups	343.445	69	4.977		
Total	436.716	73			

8 Mean grade point on CP1061 by previous institution

Descriptives

	prev ins 1			Statistic	Std. Error
CP1061	local fe	Mean		11.0370	.3976
		95% Confidence Interval for Mean	Lower Bound	10.2198	
			Upper Bound	11.8543	
		5% Trimmed Mean		11.0823	
		Median		11.0000	
		Variance		4.268	
		Std. Deviation		2.0659	
		Minimum		7.00	
		Maximum		14.00	
		Range		7.00	
		Interquartile Range		4.0000	
		Skewness		-.138	.448
		Kurtosis		-1.000	.872
	other fe	Mean		8.4000	.5207
		95% Confidence Interval for Mean	Lower Bound	7.2221	
			Upper Bound	9.5779	
		5% Trimmed Mean		8.3889	
		Median		9.0000	
		Variance		2.711	
		Std. Deviation		1.6465	
		Minimum		6.00	
		Maximum		11.00	
		Range		5.00	
		Interquartile Range		2.5000	
		Skewness		-.246	.687
		Kurtosis		-.687	1.334
	school	Mean		9.3043	.4968
		95% Confidence Interval for Mean	Lower Bound	8.2741	
			Upper Bound	10.3346	
		5% Trimmed Mean		9.3382	
		Median		9.0000	
		Variance		5.676	
		Std. Deviation		2.3824	
		Minimum		5.00	
		Maximum		13.00	
		Range		8.00	
		Interquartile Range		3.0000	
		Skewness		-.198	.481
		Kurtosis		-.537	.935
	o/s	Mean		9.6667	1.3333
		95% Confidence Interval for Mean	Lower Bound	3.9298	
			Upper Bound	15.4035	
		5% Trimmed Mean		.	
		Median		11.0000	
		Variance		5.333	
		Std. Deviation		2.3094	
		Minimum		7.00	
		Maximum		11.00	
		Range		4.00	
		Interquartile Range		.	
		Skewness		-1.732	1.225
		Kurtosis		.	.
	other	Mean		11.6364	.8121
		95% Confidence Interval for Mean	Lower Bound	9.8269	
			Upper Bound	13.4458	
		5% Trimmed Mean		11.7071	
		Median		12.0000	
		Variance		7.255	
		Std. Deviation		2.6934	
		Minimum		7.00	
		Maximum		15.00	
		Range		8.00	
		Interquartile Range		4.0000	
		Skewness		-.840	.661
		Kurtosis		-.234	1.279

9 Factor analysis of the 52 item ASSIST

Rotated Component Matrix[a]

	Component			
	1	2	3	4
SEEKMEAN	.364	.724	-.152	-8.42E-02
RELIDEAS	.115	.767	-6.03E-03	.308
USEEVID	.160	.863	-6.21E-02	-.125
INTIDEAS	.125	.826	1.685E-03	-.154
ORGANISE	.814	.190	-.182	-6.45E-02
TIMEMAN	.851	-1.29E-02	8.700E-02	-4.48E-02
ALERTASS	.713	.199	2.804E-02	.173
ACHIEV	.645	.352	.281	6.923E-02
MONITOR	.726	.344	3.405E-02	4.231E-02
LACKPURP	-.601	-2.31E-02	.332	.295
UNRELMEM	-2.56E-02	-.164	.902	5.461E-02
SYLLBO	1.607E-02	-8.22E-02	4.256E-02	.922
FEARFAIL	3.264E-02	2.691E-02	.910	3.647E-03

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Component Transformation Matrix

Component	1	2	3	4
1	.762	.641	-.087	-.043
2	.313	-.235	.888	.240
3	-.567	.731	.360	.124
4	.029	-.007	-.272	.962

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

10 Approaches to learning in relation to entrance qualification

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	60.000	2.057		29.167	.000
	ALEVEL	-4.152	2.507	-.250	-1.656	.102
	AVCE	-4.280	2.634	-.246	-1.625	.109

a. Dependent Variable: DEEPAPP

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	75.438	2.551		29.576	.000
	ALEVEL	-7.801	3.108	-.363	-2.510	.014
	AVCE	-.478	3.266	-.021	-.146	.884

a. Dependent Variable: STRATEG

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	43.312	2.184		19.835	.000
	ALEVEL	3.112	2.661	.176	1.169	.246
	AVCE	5.408	2.796	.291	1.934	.057

a. Dependent Variable: SURFAP

11 Results of approaches to learning vs. maturity

Group Statistics

	maturity	N	Mean	Std. Deviation	Std. Error Mean
DEEPAPP	under 21	72	54.9583	8.4177	.9920
	21 plus	14	63.9286	7.2373	1.9343
STRATEG	under 21	72	70.7917	10.6241	1.2521
	21 plus	14	73.1429	11.6213	3.1059
SURFAP	under 21	72	47.2500	8.8361	1.0413
	21 plus	14	45.0714	7.9852	2.1341

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DEEPA	Equal variances assumed	1.378	.244	-3.724	84	.000	-8.9702	2.4086	3.7600	-4.1805
	Equal variances not assumed			-4.126	20.479	.001	-8.9702	2.1738	3.4980	-4.4425
STRATI	Equal variances assumed	.000	.990	-.746	84	.458	-2.3512	3.1501	8.6154	3.9130
	Equal variances not assumed			-.702	17.484	.492	-2.3512	3.3488	9.4017	4.6993
SURFA	Equal variances assumed	.041	.841	.856	84	.394	2.1786	2.5441	2.8806	7.2378
	Equal variances not assumed			.917	19.723	.370	2.1786	2.3746	2.7793	7.1365

12 Module results by entrance qualification

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.400	1.525		4.851	.000
	ALEVEL	-.617	1.683	-.092	-.367	.716
	AVCE	-1.00E-01	1.868	-.013	-.054	.958

a. Dependent Variable: CP1016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.429	1.169		10.634	.000
	ALEVEL	-2.817	1.377	-.418	-2.045	.048
	AVCE	-4.370	1.389	-.642	-3.147	.003

a. Dependent Variable: CP1052

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	9.889	1.271		7.780	.000
	ALEVEL	-.576	1.439	-.075	-.401	.690
	AVCE	-2.306	1.491	-.290	-1.547	.127

a. Dependent Variable: CP1053

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	11.286	1.361		8.293	.000
	ALEVEL	-4.397	1.815	-.518	-2.423	.022
	AVCE	-4.429	1.667	-.567	-2.657	.013

a. Dependent Variable: CP1054

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	11.800	1.199		9.845	.000
	ALEVEL	-.911	1.495	-.121	-.609	.545
	AVCE	-.800	1.511	-.105	-.530	.599

a. Dependent Variable: CP1055

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	7.769	.808		9.619	.000
	ALEVEL	.534	.954	.090	.560	.577
	AVCE	-1.089	.996	-.177	-1.094	.278

a. Dependent Variable: CP1056

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	7.800	2.186		3.568	.001
	ALEVEL	.438	2.432	.045	.180	.858
	AVCE	-1.618	2.636	-.155	-.614	.543

a. Dependent Variable: CP1057

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	10.750	.593		18.121	.000
	ALEVEL	-.363	.730	-.076	-.497	.621
	AVCE	-1.190	.760	-.239	-1.566	.122

a. Dependent Variable: CP1061

13 Effects of approaches to studying on module grades

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.098	5.559		.377	.708
	DEEPAPP	.157	.068	.369	2.314	.026
	STRATEG	3.524E-03	.049	.012	.073	.943
	SURFAP	-3.44E-02	.059	-.090	-.587	.561

a. Dependent Variable: CP1052

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.447	3.261		1.977	.052
	DEEPAPP	.147	.040	.438	3.677	.000
	STRATEG	-6.77E-02	.032	-.251	-2.125	.037
	SURFAP	-4.88E-02	.036	-.149	-1.359	.179

a. Dependent Variable: CP1056

Appendix (xii)

Statistical analyses for main study

14 Module results by entrance qualification

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1016	116	1.00	15.00	6.7672	3.5542
Valid N (listwise)	116				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.138	.652		10.952	.000
	ENTQUAL1	.176	.816	.025	.215	.830
	ENTQUAL2	-1.443	.876	-.189	-1.648	.102

a. Dependent Variable: CP1016

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1052	92	1.00	15.00	7.8261	3.6059
Valid N (listwise)	92				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.900	.796		8.664	.000
	ENTQUAL1	1.400	1.028	.189	1.362	.177
	ENTQUAL2	.729	.998	.101	.730	.468

a. Dependent Variable: CP1052

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1053	213	1.00	16.00	7.0845	3.9096
Valid N (listwise)	213				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.391	.568		11.249	.000
	ENTQUAL1	1.451	.700	.185	2.074	.039
	ENTQUAL2	.163	.724	.020	.225	.822

a. Dependent Variable: CP1053

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1054	62	1.00	15.00	6.5968	4.1822
Valid N (listwise)	62				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.778	.965		4.954	.000
	ENTQUAL1	3.012	1.346	.335	2.238	.029
	ENTQUAL2	2.677	1.301	.308	2.058	.044

a. Dependent Variable: CP1054

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1055	178	1.00	16.00	10.0787	4.3054
Valid N (listwise)	178				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.286	.795		11.680	.000
	ENTQUAL1	.112	.919	.013	.122	.903
	ENTQUAL2	2.042	.960	.229	2.127	.035

a. Dependent Variable: CP1055

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1056	172	1.00	16.00	7.7965	3.4792
Valid N (listwise)	172				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.674	.526		14.599	.000
	ENTQUAL1	.756	.664	.108	1.138	.257
	ENTQUAL2	-.456	.702	-.062	-.650	.516

a. Dependent Variable: CP1056

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1057	102	1.00	16.00	7.7353	4.9170
Valid N (listwise)	102				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.864	1.025		8.644	.000
	ENTQUAL1	-.530	1.227	-.054	-.432	.666
	ENTQUAL2	-3.036	1.360	-.280	-2.233	.028

a. Dependent Variable: CP1057

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP1061	103	1.00	16.00	8.6214	3.7550
Valid N (listwise)	103				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.033	.691		11.629	.000
	ENTQUAL1	.717	.881	.095	.814	.418
	ENTQUAL2	1.133	1.036	.128	1.094	.277

a. Dependent Variable: CP1061

15 Previous institution attended by 2003/04 cohort

previn2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Local FE	55	20.4	21.6	21.6
	Other FE	66	24.5	25.9	47.5
	School	91	33.8	35.7	83.1
	Overseas	20	7.4	7.8	91.0
	Other	23	8.6	9.0	100.0
	Total	255	94.8	100.0	
Missing	System	14	5.2		
Total		269	100.0		

16 Factor analysis of the 52 item ASSIST questionnaire for the 2003/04 cohort

Rotated Component Matrix[a]

	Component		
	1	2	3
SEEKMEAN	.506	.658	-2.63E-03
RELIDEAS	.216	.796	2.010E-02
USEEVID	.165	.842	-6.86E-02
INTIDEAS	.256	.822	3.695E-02
ORGANISE	.785	.355	-7.88E-02
TIMEMAN	.751	.225	-.101
ALERTASS	.783	.242	.166
ACHIEV	.621	.550	5.861E-02
MONITOR	.716	.455	-1.78E-02
LACKPURP	-.632	.186	.538
UNRELMEM	5.840E-02	7.169E-02	.875
SYLLBO	-.135	-.155	.431
FEARFAIL	.111	6.632E-02	.858

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Component Transformation Matrix

Component	1	2	3
1	.729	.684	-.019
2	-.205	.245	.948
3	.653	-.687	.319

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

17 Approaches to learning in relation to entrance qualification

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
DEEPAPP	84	35.00	76.00	54.2738	8.3050
Valid N (listwise)	84				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	57.091	1.708		33.416	.000
	ENTQUAL1	-4.604	2.137	-.284	-2.155	.034
	ENTQUAL2	-2.880	2.510	-.151	-1.148	.255

a. Dependent Variable: DEEPAPP

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
STRATEG	84	43.00	98.00	67.1429	11.4830
Valid N (listwise)	84				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	66.409	2.330		28.504	.000
	ENTQUAL1	-2.435	2.914	-.108	-.836	.406
	ENTQUAL2	6.644	3.422	.250	1.941	.056

a. Dependent Variable: STRATEG

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SURFAP	83	30.00	68.00	47.8554	9.5727
Valid N (listwise)	83				

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	49.773	2.005		24.819	.000
	ENTQUAL1	-4.141	2.520	-.220	-1.643	.104
	ENTQUAL2	-1.510	2.946	-.069	-.512	.610

a. Dependent Variable: SURFAP

18 Effects of approaches to studying on module grades

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-10.151	7.444		-1.364	.186
	DEEPAPP	-2.80E-02	.100	-.064	-.279	.783
	STRATEG	.187	.076	.584	2.453	.022
	SURFAP	.140	.078	.354	1.796	.086

a. Dependent Variable: CP1052

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-2.662	5.030		-.529	.599
	DEEPAPP	1.211E-03	.083	.002	.015	.988
	STRATEG	.108	.061	.289	1.777	.081
	SURFAP	.126	.055	.292	2.289	.026

a. Dependent Variable: CP1055

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.007	9.593		.418	.679
	DEEPAPP	.307	.154	.507	1.996	.054
	STRATEG	-.153	.101	-.360	-1.510	.140
	SURFAP	-6.33E-02	.123	-.090	-.513	.611

a. Dependent Variable: CP1057

19 Grade point by entrance qualification

Report

CP1052

ent qual	Mean	N	Std. Deviation
A levels	8.4839	31	3.9822
AVCE	7.6286	35	3.0591
GNVQ	8.0000	2	1.4142
BTEC	4.0000	2	1.4142
Access	6.6667	6	4.3665
Other	6.8889	9	4.0757
Overseas	12.0000	1	.
HNC/HND	9.5000	2	3.5355
Total	7.8068	88	3.5907

Report

CP1055

ent qual	Mean	N	Std. Deviation
A levels	9.4643	84	4.6060
AVCE	11.3279	61	3.7136
GNVQ	11.0000	3	1.0000
BTEC	6.5000	6	3.8859
Access	10.5000	6	3.9370
Other	8.2500	8	4.7132
Overseas	11.5000	2	3.5355
HNC/HND	12.5000	4	1.7321
Total	10.1149	174	4.2885

Report

CP1057

ent qual	Mean	N	Std. Deviation
A levels	8.3333	51	4.6890
AVCE	5.8276	29	4.4647
BTEC	7.5000	2	6.3640
Access	8.5000	2	9.1924
Other	8.5000	8	6.2792
Overseas	7.6667	3	7.0238
HNC/HND	10.2857	7	4.2706
Total	7.7353	102	4.9170

20 Results of approach to learning vs. age

Group Statistics

	maturity	N	Mean	Std. Deviation	Std. Error Mean
DEEPAPP	Under 21	63	53.3016	8.0033	1.0083
	21 plus	21	57.1905	8.7041	1.8994
STRATEG	Under 21	63	66.7778	11.0518	1.3924
	21 plus	21	68.2381	12.9186	2.8191
SURFAP	Under 21	62	48.1935	9.8228	1.2475
	21 plus	21	46.8571	8.9459	1.9521

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DEEPAI	Equal variances assumed	.004	.948	-1.887	82	.063	-3.8889	2.0611	-7.9891	.2113
	Equal variances not assumed			-1.808	32.040	.080	-3.8889	2.1504	-8.2690	.4912
STRATE	Equal variances assumed	.014	.906	-.502	82	.617	-1.4603	2.9066	-7.2424	4.3218
	Equal variances not assumed			-.464	30.366	.646	-1.4603	3.1442	-7.8784	4.9577
SURFAI	Equal variances assumed	.472	.494	.551	81	.583	1.3364	2.4273	-3.4932	6.1660
	Equal variances not assumed			.577	37.613	.567	1.3364	2.3167	-3.3551	6.0279

21 Results of one way ANOVA of students' preferences for different types of course and teaching by entrance qualification (3 groups)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
CA	Between Groups	1.437	2	.719	.520	.597
	Within Groups	106.513	77	1.383		
	Total	107.950	79			
CB	Between Groups	2.603	2	1.302	1.202	.306
	Within Groups	83.397	77	1.083		
	Total	86.000	79			
CC	Between Groups	1.724	2	.862	.681	.509
	Within Groups	97.476	77	1.266		
	Total	99.200	79			
CD	Between Groups	3.909	2	1.955	1.613	.206
	Within Groups	93.278	77	1.211		
	Total	97.188	79			
CE	Between Groups	3.716	2	1.858	1.387	.256
	Within Groups	103.172	77	1.340		
	Total	106.888	79			
CF	Between Groups	.472	2	.236	.258	.773
	Within Groups	70.328	77	.913		
	Total	70.800	79			
CG	Between Groups	11.198	2	5.599	5.803	.004
	Within Groups	74.290	77	.965		
	Total	85.488	79			
CH	Between Groups	5.904	2	2.952	3.360	.040
	Within Groups	67.646	77	.879		
	Total	73.550	79			
CI	Between Groups	.935	2	.467	.503	.607
	Within Groups	71.553	77	.929		
	Total	72.487	79			

22 & 23 Post hoc tests results comparison between entrance qualification groups for statement Cg

Multiple Comparisons

Bonferroni

Dependent Variable	(I) ENTQUALA	(J) ENTQUALA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
CA	A level	AVCE	-.31	.33	1.000	-1.11	.50
		Other	-.22	.31	1.000	-.99	.54
	AVCE	A level	.31	.33	1.000	-.50	1.11
		Other	8.37E-02	.37	1.000	-.82	.99
	Other	A level	.22	.31	1.000	-.54	.99
		AVCE	-8.37E-02	.37	1.000	-.99	.82
CB	A level	AVCE	-.28	.29	.993	-1.00	.43
		Other	-.41	.28	.440	-1.09	.27
	AVCE	A level	.28	.29	.993	-.43	1.00
		Other	-.12	.33	1.000	-.92	.68
	Other	A level	.41	.28	.440	-.27	1.09
		AVCE	.12	.33	1.000	-.68	.92
CC	A level	AVCE	-.36	.31	.757	-1.13	.41
		Other	-6.88E-02	.30	1.000	-.80	.67
	AVCE	A level	.36	.31	.757	-.41	1.13
		Other	.29	.35	1.000	-.57	1.16
	Other	A level	6.88E-02	.30	1.000	-.67	.80
		AVCE	-.29	.35	1.000	-1.16	.57
CD	A level	AVCE	-4.05E-02	.31	1.000	-.79	.71
		Other	-.51	.29	.264	-1.23	.21
	AVCE	A level	4.05E-02	.31	1.000	-.71	.79
		Other	-.47	.34	.540	-1.31	.38
	Other	A level	.51	.29	.264	-.21	1.23
		AVCE	.47	.34	.540	-.38	1.31
CE	A level	AVCE	-.44	.32	.531	-1.23	.35
		Other	.13	.31	1.000	-.62	.89
	AVCE	A level	.44	.32	.531	-.35	1.23
		Other	.57	.36	.352	-.31	1.46
	Other	A level	-.13	.31	1.000	-.89	.62
		AVCE	-.57	.36	.352	-1.46	.31
CF	A level	AVCE	-.19	.27	1.000	-.84	.47
		Other	-9.91E-02	.25	1.000	-.72	.52
	AVCE	A level	.19	.27	1.000	-.47	.84
		Other	8.85E-02	.30	1.000	-.64	.82
	Other	A level	9.91E-02	.25	1.000	-.52	.72
		AVCE	-8.85E-02	.30	1.000	-.82	.64
CG	A level	AVCE	-.42	.27	.403	-1.09	.26
		Other	-.89*	.26	.003	-1.53	-.25
	AVCE	A level	.42	.27	.403	-.26	1.09
		Other	-.47	.31	.389	-1.22	.28
	Other	A level	.89*	.26	.003	.25	1.53
		AVCE	.47	.31	.389	-.28	1.22
CH	A level	AVCE	7.15E-02	.26	1.000	-.57	.71
		Other	-.58	.25	.068	-1.19	3.01E-02
	AVCE	A level	-7.15E-02	.26	1.000	-.71	.57
		Other	-.65	.29	.087	-1.37	6.53E-02
	Other	A level	.58	.25	.068	-3.01E-02	1.19
		AVCE	.65	.29	.087	-6.53E-02	1.37
CI	A level	AVCE	-.24	.27	1.000	-.90	.42
		Other	-.19	.26	1.000	-.82	.44
	AVCE	A level	.24	.27	1.000	-.42	.90
		Other	5.02E-02	.30	1.000	-.69	.79
	Other	A level	.19	.26	1.000	-.44	.82
		AVCE	-5.02E-02	.30	1.000	-.79	.69

*. The mean difference is significant at the .05 level.

24 Results of one way ANOVA of students' preferences for different types of course and teaching by entrance qualification (6 groups)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
CA	Between Groups	5.223	7	.746	.523	.814
	Within Groups	102.727	72	1.427		
	Total	107.950	79			
CB	Between Groups	4.995	7	.714	.634	.726
	Within Groups	81.005	72	1.125		
	Total	86.000	79			
CC	Between Groups	6.259	7	.894	.693	.678
	Within Groups	92.941	72	1.291		
	Total	99.200	79			
CD	Between Groups	9.141	7	1.306	1.068	.393
	Within Groups	88.046	72	1.223		
	Total	97.188	79			
CE	Between Groups	16.501	7	2.357	1.878	.086
	Within Groups	90.387	72	1.255		
	Total	106.888	79			
CF	Between Groups	5.169	7	.738	.810	.582
	Within Groups	65.631	72	.912		
	Total	70.800	79			
CG	Between Groups	21.137	7	3.020	3.379	.004
	Within Groups	64.350	72	.894		
	Total	85.488	79			
CH	Between Groups	9.106	7	1.301	1.453	.198
	Within Groups	64.444	72	.895		
	Total	73.550	79			
CI	Between Groups	5.624	7	.803	.865	.538
	Within Groups	66.863	72	.929		
	Total	72.487	79			

25 Mean scores of groups for statement Cg on ASSIST

Descriptives [a]

	ent qual			Statistic	Std. Error
CG	A levels	Mean		2.79	.15
		95% Confidence Interval for Mean	Lower Bound	2.50	
			Upper Bound	3.09	
		5% Trimmed Mean		2.80	
		Median		3.00	
		Variance		.852	
		Std. Deviation		.92	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		.009	.378
		Kurtosis		-.108	.741
	AVCE	Mean		3.21	.24
		95% Confidence Interval for Mean	Lower Bound	2.71	
			Upper Bound	3.71	
		5% Trimmed Mean		3.23	
		Median		3.00	
		Variance		1.064	
		Std. Deviation		1.03	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		-.129	.524
		Kurtosis		.043	1.014
	GNVQ	Mean		4.50	.50
		95% Confidence Interval for Mean	Lower Bound	2.91	
			Upper Bound	6.09	
		5% Trimmed Mean		4.56	
		Median		5.00	
		Variance		1.000	
		Std. Deviation		1.00	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.50	
		Skewness		-2.000	1.014
		Kurtosis		4.000	2.619
	BTEC	Mean		2.33	.33
		95% Confidence Interval for Mean	Lower Bound	.90	
			Upper Bound	3.77	
		5% Trimmed Mean		.	
		Median		2.00	
		Variance		.333	
		Std. Deviation		.58	
		Minimum		2	
		Maximum		3	
		Range		1	
		Interquartile Range		.	
		Skewness		1.732	1.225
		Kurtosis		.	.
	Access	Mean		3.67	.88
		95% Confidence Interval for Mean	Lower Bound	-.13	
			Upper Bound	7.46	
		5% Trimmed Mean		.	
		Median		4.00	
		Variance		2.333	
		Std. Deviation		1.53	
		Minimum		2	
		Maximum		5	
		Range		3	
		Interquartile Range		.	
		Skewness		-.935	1.225
		Kurtosis		.	.
	Other	Mean		3.67	.24
		95% Confidence Interval for Mean	Lower Bound	3.12	
			Upper Bound	4.21	
		5% Trimmed Mean		3.63	
		Median		4.00	
		Variance		.500	
		Std. Deviation		.71	
		Minimum		3	
		Maximum		5	
		Range		2	
		Interquartile Range		1.00	
		Skewness		.606	.717
		Kurtosis		-.286	1.400
	HNC/HND	Mean		3.50	.50
		95% Confidence Interval for Mean	Lower Bound	-2.85	
			Upper Bound	9.85	
		5% Trimmed Mean		.	
		Median		3.50	
		Variance		.500	
		Std. Deviation		.71	
		Minimum		3	
		Maximum		4	
		Range		1	
		Interquartile Range		.	
		Skewness		.	.
		Kurtosis		.	.

a. CG is constant when ent qual = Overseas. It has been omitted.

26 Mean scores for student preferences for different types of course and teaching by age

Descriptives

	maturity			Statistic	Std. Error
CA	Under 21	Mean		3.83	.15
		95% Confidence Interval for Mean	Lower Bound	3.53	
			Upper Bound	4.12	
		5% Trimmed Mean		3.91	
		Median		4.00	
		Variance		1.340	
		Std. Deviation		1.16	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.00	
		Skewness		-.678	.302
		Kurtosis		-.285	.595
	21 plus	Mean		3.81	.26
		95% Confidence Interval for Mean	Lower Bound	3.26	
			Upper Bound	4.36	
		5% Trimmed Mean		3.90	
		Median		4.00	
		Variance		1.462	
		Std. Deviation		1.21	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.00	
		Skewness		-.911	.501
		Kurtosis		-.051	.972
CB	Under 21	Mean		3.98	.12
		95% Confidence Interval for Mean	Lower Bound	3.73	
			Upper Bound	4.23	
		5% Trimmed Mean		4.06	
		Median		4.00	
		Variance		.984	
		Std. Deviation		.99	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.00	
		Skewness		-.685	.302
		Kurtosis		-.096	.595
	21 plus	Mean		4.10	.26
		95% Confidence Interval for Mean	Lower Bound	3.56	
			Upper Bound	4.63	
		5% Trimmed Mean		4.21	
		Median		4.00	
		Variance		1.390	
		Std. Deviation		1.18	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		-1.414	.501
		Kurtosis		1.329	.972
CC	Under 21	Mean		3.98	.12
		95% Confidence Interval for Mean	Lower Bound	3.73	
			Upper Bound	4.23	
		5% Trimmed Mean		4.07	
		Median		4.00	
		Variance		.984	
		Std. Deviation		.99	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.00	
		Skewness		-.890	.302
		Kurtosis		.772	.595
	21 plus	Mean		3.67	.30
		95% Confidence Interval for Mean	Lower Bound	3.03	
			Upper Bound	4.30	
		5% Trimmed Mean		3.74	
		Median		4.00	
		Variance		1.933	
		Std. Deviation		1.39	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		2.50	
		Skewness		-.690	.501
		Kurtosis		-.794	.972
CD	Under 21	Mean		3.63	.14
		95% Confidence Interval for Mean	Lower Bound	3.35	
			Upper Bound	3.91	
		5% Trimmed Mean		3.71	
		Median		4.00	
		Variance		1.236	
		Std. Deviation		1.11	
		Minimum		1	
		Maximum		5	
		Range		4	
		Interquartile Range		1.00	
		Skewness		-.680	.302
		Kurtosis		.071	.595
	21 plus	Mean		3.90	.23
		95% Confidence Interval for Mean	Lower Bound	3.43	
			Upper Bound	4.38	
		5% Trimmed Mean		3.95	
		Median		4.00	
		Variance		1.090	
		Std. Deviation		1.04	
		Minimum		2	
		Maximum		5	

Phase two

27 Module results by entrance qualification

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2001	105	.00	16.00	8.5524	4.4441
Valid N (listwise)	105				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.875	.909		9.760	.000
	ENTQUAL1	-.449	1.118	-.051	-.402	.688
	ENTQUAL2	-3.12E-02	1.203	-.003	-.026	.979

a. Dependent Variable: CP2001

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2020	47	.00	14.00	10.2553	3.0322
Valid N (listwise)	47				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.400	.982		9.572	.000
	ENTQUAL1	.867	1.268	.134	.684	.498
	ENTQUAL2	1.350	1.203	.220	1.122	.268

a. Dependent Variable: CP2020

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2023	50	.00	16.00	7.6200	4.3654
Valid N (listwise)	50				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.636	1.212		6.301	.000
	ENTQUAL1	1.441	1.446	.170	.996	.324
	ENTQUAL2	-2.553	1.678	-.260	-1.522	.135

a. Dependent Variable: CP2023

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2080	45	.00	14.00	9.3333	2.7961
Valid N (listwise)	45				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	9.400	.917		10.253	.000
	ENTQUAL1	-6.67E-02	1.184	-.011	-.056	.955
	ENTQUAL2	1.000E-01	1.143	.018	.087	.931

a. Dependent Variable: CP2080

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2087	61	.00	15.00	8.1148	3.2357
Valid N (listwise)	61				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.000	.852		9.393	.000
	ENTQUAL1	-6.25E-02	1.032	-.010	-.061	.952
	ENTQUAL2	.769	1.250	.098	.615	.541

a. Dependent Variable: CP2087

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2089	59	.00	15.00	8.6102	3.7140
Valid N (listwise)	59				

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.500	.995		8.546	.000
	ENTQUAL1	.500	1.198	.069	.417	.678
	ENTQUAL2	-.269	1.433	-.031	-.188	.852

a. Dependent Variable: CP2089

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CP2091	43	1.00	15.00	7.5349	3.2097
Valid N (listwise)	43				

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	7.500	1.006		7.453	.000
	ENTQUAL1	1.000	1.318	.151	.759	.452
	ENTQUAL2	-.444	1.255	-.070	-.354	.725

a. Dependent Variable: CP2091

28 Factor analysis of the 52 item ASSIST questionnaire for 2003/04 cohort (Level 2)

Rotated Component Matrix[a]

	Component 1	Component 2	Component 3
SEEKMEAN	.506	.658	-2.63E-03
RELIDEAS	.216	.796	2.010E-02
USEEVID	.165	.842	-6.86E-02
INTIDEAS	.256	.822	3.695E-02
ORGANISE	.785	.355	-7.88E-02
TIMEMAN	.751	.225	-.101
ALERTASS	.783	.242	.166
ACHIEV	.621	.550	5.861E-02
MONITOR	.716	.455	-1.78E-02
LACKPURP	-.632	.186	.538
UNRELMEM	5.840E-02	7.169E-02	.875
SYLLBO	-.135	-.155	.431
FEARFAIL	.111	6.632E-02	.858

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

29 Result of ANOVA for statement B24 by entrance qualification (3 groups)

ANOVA

B24_2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.983	2	4.492	4.490	.018
Within Groups	37.017	37	1.000		
Total	46.000	39			

Multiple Comparisons

Dependent Variable: B24_2
Bonferroni

(I) ENTQUALA	(J) ENTQUALA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A level	AVCE	1.0833*	.3728	.018	.1485	2.0181
	Other	.7000	.3945	.253	-.2893	1.6893
AVCE	A level	-1.0833*	.3728	.018	-2.0181	-.1485
	Other	-.3833	.4283	1.000	-1.4573	.6907
Other	A level	-.7000	.3945	.253	-1.6893	.2893
	AVCE	.3833	.4283	1.000	-.6907	1.4573

*. The mean difference is significant at the .05 level.

Descriptives

	entquala			Statistic	Std. Error
B24_2	A level	Mean		4.5000	.1457
		95% Confidence Interval for Mean	Lower Bound	4.1925	
			Upper Bound	4.8075	
		5% Trimmed Mean		4.5556	
		Median		5.0000	
		Variance		.382	
		Std. Deviation		.6183	
		Minimum		3.00	
		Maximum		5.00	
		Range		2.00	
		Interquartile Range		1.0000	
		Skewness		-.840	.536
		Kurtosis		-.101	1.038
	AVCE	Mean		3.5385	.3323
		95% Confidence Interval for Mean	Lower Bound	2.8143	
			Upper Bound	4.2626	
		5% Trimmed Mean		3.5983	
		Median		4.0000	
		Variance		1.436	
		Std. Deviation		1.1983	
		Minimum		1.00	
		Maximum		5.00	
		Range		4.00	
		Interquartile Range		1.5000	
		Skewness		-.622	.616
		Kurtosis		.174	1.191
	Other	Mean		3.9333	.3003
		95% Confidence Interval for Mean	Lower Bound	3.2893	
			Upper Bound	4.5773	
		5% Trimmed Mean		4.0370	
		Median		4.0000	
		Variance		1.352	
		Std. Deviation		1.1629	
		Minimum		1.00	
		Maximum		5.00	
		Range		4.00	
		Interquartile Range		1.0000	
		Skewness		-1.426	.580
		Kurtosis		1.953	1.121

30 *Post hoc* tests results of comparison between entrance qualification and grade point score on module CP2023

ANOVA

CP2023

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	131.222	2	65.611	4.060	.024
Within Groups	743.308	46	16.159		
Total	874.531	48			

Multiple Comparisons

Dependent Variable: CP2023

Bonferroni

(I) ENTQUALA	(J) ENTQUALA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A level	AVCE	3.9936*	1.4029	.020	.5079	7.4793
	Other	1.4406	1.4459	.973	-2.1519	5.0331
AVCE	A level	-3.9936*	1.4029	.020	-7.4793	-.5079
	Other	-2.5530	1.6780	.405	-6.7223	1.6162
Other	A level	-1.4406	1.4459	.973	-5.0331	2.1519
	AVCE	2.5530	1.6780	.405	-1.6162	6.7223

*. The mean difference is significant at the .05 level.

31 Results of approaches to learning vs. age

Group Statistics

	maturity	N	Mean	Std. Deviation	Std. Error Mean
DEEPAPP2	Under 21	36	53.7500	8.2475	1.3746
	21 plus	17	58.6471	9.5259	2.3104
STRATEG2	Under 21	36	69.9444	9.3593	1.5599
	21 plus	17	71.6471	10.5234	2.5523
SURFAP2	Under 21	36	50.6944	9.5284	1.5881
	21 plus	17	50.1176	8.0069	1.9420

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DEEPAP	Equal variances assumed	.554	.460	-1.920	51	.061	-4.8971	2.5511	0.0186	.2245
	Equal variances not assumed			-1.822	27.743	.079	-4.8971	2.6884	0.4062	.6121
STRATE	Equal variances assumed	.380	.540	-.594	51	.555	-1.7026	2.8662	-7.4567	4.0514
	Equal variances not assumed			-.569	28.375	.574	-1.7026	2.9912	-7.8262	4.4210
SURFAP	Equal variances assumed	.624	.433	.216	51	.830	.5768	2.6716	-4.7867	5.9403
	Equal variances not assumed			.230	36.992	.819	.5768	2.5086	-4.5062	5.6598

32 Results of one way ANOVA of students' preferences for different types of course and teaching by maturity

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
CA_2	Between Groups	.712	1	.712	.488	.488
	Within Groups	74.458	51	1.460		
	Total	75.170	52			
CB_2	Between Groups	.143	1	.143	.175	.677
	Within Groups	41.556	51	.815		
	Total	41.698	52			
CC_2	Between Groups	.346	1	.346	.342	.561
	Within Groups	51.654	51	1.013		
	Total	52.000	52			
CD_2	Between Groups	.562	1	.562	.455	.503
	Within Groups	62.985	51	1.235		
	Total	63.547	52			
CE_2	Between Groups	4.546	1	4.546	5.092	.028
	Within Groups	45.529	51	.893		
	Total	50.075	52			
CF_2	Between Groups	.684	1	.684	.917	.343
	Within Groups	38.070	51	.746		
	Total	38.755	52			
CG_2	Between Groups	1.172	1	1.172	1.071	.306
	Within Groups	55.809	51	1.094		
	Total	56.981	52			
CH_2	Between Groups	.809	1	.809	.793	.377
	Within Groups	52.059	51	1.021		
	Total	52.868	52			
CI_2	Between Groups	1.283	1	1.283	1.258	.267
	Within Groups	52.000	51	1.020		
	Total	53.283	52			

<u>33 Mean scores for student preferences for different types of course and teaching by age</u>

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CE_2	53	1.00	5.00	4.1321	.9813
Valid N (listwise)	53				

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	maturity	N	Percent	N	Percent	N	Percent
CE_2	Under 21	36	17.8%	166	82.2%	202	100.0%
	21 plus	17	27.9%	44	72.1%	61	100.0%

Descriptives

	maturity			Statistic	Std. Error
CE_2	Under 21	Mean		4.3333	.1380
		95% Confidence Interval for Mean	Lower Bound	4.0532	
			Upper Bound	4.6135	
		5% Trimmed Mean		4.4012	
		Median		5.0000	
		Variance		.686	
		Std. Deviation		.8281	
		Minimum		2.00	
		Maximum		5.00	
		Range		3.00	
		Interquartile Range		1.0000	
		Skewness		-1.030	.393
		Kurtosis		.283	.768
	21 plus	Mean		3.7059	.2813
		95% Confidence Interval for Mean	Lower Bound	3.1095	
			Upper Bound	4.3023	
		5% Trimmed Mean		3.7843	
		Median		4.0000	
		Variance		1.346	
		Std. Deviation		1.1600	
		Minimum		1.00	
		Maximum		5.00	
		Range		4.00	
		Interquartile Range		2.0000	
		Skewness		-.707	.550
		Kurtosis		.235	1.063

Appendix (xiii)

Paper delivered at SEDA conference 2003

The Stepping Stones Project.

Improving the achievement of students entering higher education (HE) computing courses through an investigation of learning styles and strategies, and the introduction of an intervention programme.

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Abstract.

This three-year longitudinal study using the action research paradigm aims to identify students at risk of failure early in their course through an investigation of learning styles, entrance qualification, previous institution and personal details. Learning styles are being evaluated using the ASSIST questionnaire. Other student information and module results are obtained from Registry. The resulting data are being analysed by descriptive statistics, factor analysis, linear regression and one-way analysis of variance (ANOVA) using SPSS version 10. The results obtained at the end of the first year show that students with AVCE entrance qualifications are more likely to perform less well than others, and those with A levels also perform poorly on all but two modules at level one. This may be a reflection of the grades obtained at A level by our students or the assessment requirements of the AVCE qualification.

Introduction.

The Stepping Stones Project at the School of Computing and Information Technology (SCIT), University of Wolverhampton, is at the end of the first year of its three-year duration. The university is a former polytechnic, wide access institution with a diverse range of students, many of whom are drawn from the local multi-cultural community. In line with other wide access institutions, there are difficulties associated with supporting and fostering learning where students' prior educational experiences are very varied. For most institutions this hinges on using the first year of a degree course as a time for students to adapt to the styles of teaching and assessment required in tertiary education, and many studies (e.g. McInnis, 2001) have been conducted on the first-year experience in order to improve the transition into HE for students. Modern universities, especially, have found that large numbers of students now come from non-traditional backgrounds. Since there is seen to be a correlation between increasing access to students from non-traditional backgrounds and higher drop-out rates (Bamber and Tett, 2000) this presents problems in terms of achievement and retention.

The ASSIST questionnaire, developed by the University of Edinburgh and customised within SCIT, is used to evaluate a student's learning style and provides information on the factors, which contribute to this diagnosis, e.g. lack of purpose. ASSIST aims to help staff to identify students who are experiencing difficulty with their work and enables them to investigate the ways in which their teaching is influencing student learning (Tait *et al*., 1998).

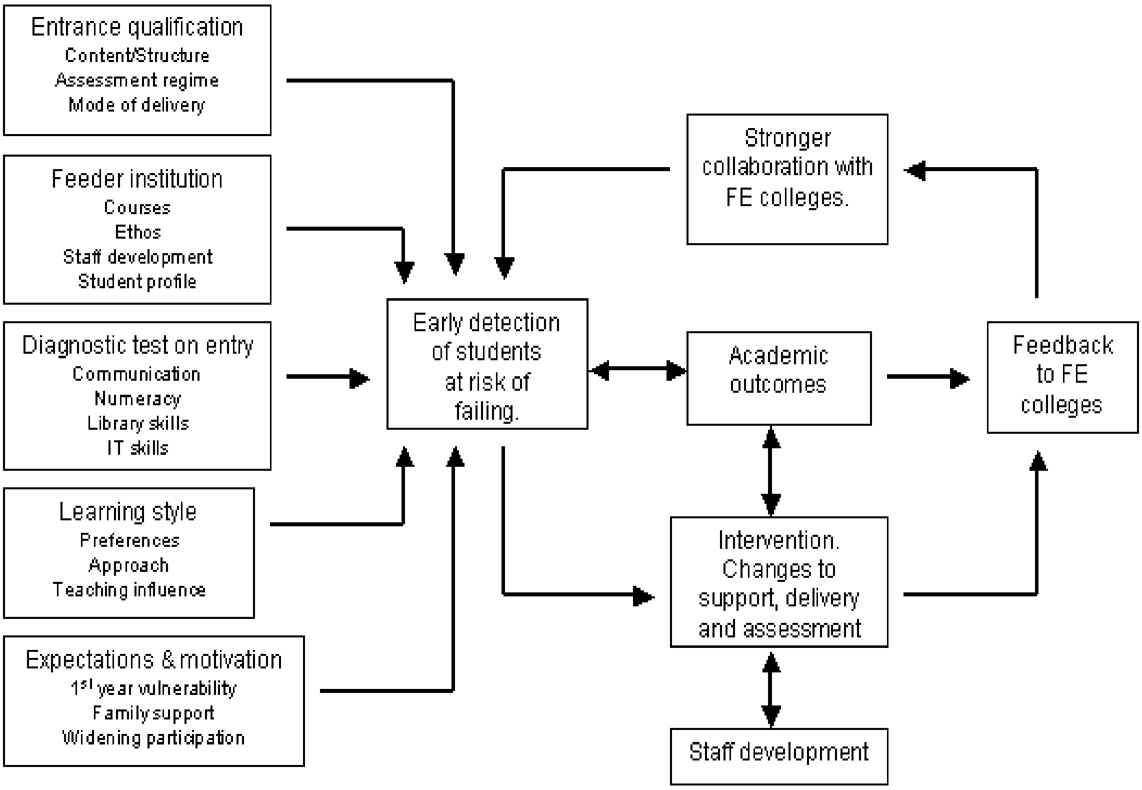
The learning styles and strategies adopted by students and the particular further education institution where they previously studied are thought to be influential in determining a student's chance of success. It is vital therefore that changes to curriculum, delivery, assessment and support are underpinned by detailed knowledge of the approaches to learning adopted by our students. Changes should also reflect those factors which enable and encourage students to adopt a deep approach to learning, since a student's approach to a given learning activity depends upon his or her perception of the requirements of the task (Laurillard, 2002).

This knowledge of student factors should provide SCIT with information as to where to target additional learning support. As the entrance qualifications for HE become ever more vocational, it is recognised that there may be differences between student knowledge, expectations and starting point, and those that teaching staff in HE expect students to have, given the recent changes in courses in further education (FE) towards more vocational programmes.
Working closely with six local further education institutions, the project aims are:

- to investigate if patterns emerge between entrance qualification, feeder institution, learning styles and achievement at level one;
- to enable early detection of students at risk of being unsuccessful in HE;
- to pilot an intervention programme in HE to improve learning styles and strategies to enable a smoother transition into HE;
- to identify the FE factors that lead to successful learning in HE;
- to refine the intervention programme and to devise an appropriate staff development programme to improve awareness of issues associated with student learning, for staff involved with level one modules in SCIT;
- to develop a theoretical model that identifies the characteristics of a successful student.

Methodology.
A longitudinal case study is being conducted beginning in the year prior to HE entry in six local feeder colleges. The study, using the ASSIST questionnaire, will continue through levels one and two in HE for this cohort (approx. 100 students). Close examination of the curricula and contents of qualifying courses, and diagnostic tests on entry to HE will be undertaken to highlight areas where increased support should be given in level one. Intervention is to be piloted in HE in the second year of the research programme. Refined intervention in HE will be implemented in the third year of the research programme. Student progress will be monitored throughout years one and two and correlated with changes in ASSIST results to determine SCIT's ability to provide support. ASSIST also enables staff to investigate the ways in which their teaching is influencing student learning, hence staff development to improve teaching and learning will be based on data from ASSIST and will be developed as the project progresses. SPSS version 10 will be used for factor analysis of the data on learning styles and teaching preferences provided by ASSIST. Individual and/or focus group interviews will be conducted to a) explore the validity of data gathered by means of the ASSIST questionnaire, and b) to explore perceptions such as expectations and motivation. The use of both qualitative and quantitative data gives the project a methodologically eclectic approach (Allan, 2000).

Conceptual framework for research.



To date, the ASSIST questionnaire has been completed by the level one cohort 02/03; the resulting data were compiled into a database that was then extended to include other student details such as previous institution, entrance qualification, and personal data. Key skills data will be added shortly. The end of year module results were added to the database and statistical analysis was performed using descriptive statistics, factor analysis, AVOVA and linear regression in order to determine if patterns emerge between entrance qualification, feeder institution, learning styles and achievement at level one. The ASSIST questionnaire has also been completed by students in level zero 02/03 in our local feeder institutions who intended to enrol on computing or computer science courses at the University of Wolverhampton, 03/04.

Interim results and discussion.

Table 1. Factor analysis of the 52 item ASSIST.

(n=84)	Factor			
	1	2	3	4
Seeking meaning		.724		
Relating ideas		.767		
Use of evidence		.863		
Interest in ideas		.826		
Organised studying	.814			
Time management	.851			
Alertness to assessment demands	.713			
Achieving	.645			
Monitoring effectiveness	.726			
Lack of purpose			.332	

Unrelated memorising			.902	
Syllabus boundness				.922
Fear of failure			.910	

Factor analysis in Table 1 showed separate factors describing strategic approaches (Factor 1), deep approaches (Factor 2) and surface apathetic approaches (Factor 3). These results were very similar to results found by Edinburgh except that syllabus boundness emerged as a separate fourth factor and lack of purpose was only weakly associated with a surface approach to studying. Since syllabus boundness is often linked with a surface approach, the data set was investigated further. It was found that if students who had gained their entrance qualification to study in HE at an overseas institution were deselected from the database, syllabus boundness became a component of the third (surface apathetic) factor. This information may be of benefit in providing support and direction to overseas students and may reflect the nature of their pre-HE educational experiences.

Table 2 summarises the results of regression analysis using dummy variables when student performance on modules was investigated in relation to their entrance qualification.

Table 2. Module results by entrance qualification.

Module	N =	Credits	Overall mean grade	Mean grade (excluding AVCE / A level)	A level	Sig.	AVCE	Sig.
CP1016	39	15	6.87	7.4	-0.62	0.72	-0.1	0.96
CP1052	43	15	9.3	12.4	-2.8	0.048	-4.4	0.003
CP1053	66	30	8.64	9.9	-0.6	0.69	-2.31	0.127
CP1054	30	30	7.9	11.3	-4.4	0.022	-4.43	0.013
CP1055	45	15	11.1	11.8	-0.9	0.55	-0.8	0.59
CP1056	73	15	7.6	7.7	+0.54	0.58	-1.09	0.28
CP1057	38	30	7.4	7.8	+0.44	0.86	-1.62	0.54
CP1061	74	15	10.2	10.75	-0.36	0.62	-1.2	0.12

The module CP1052, Professional and Academic Development has two assessment tasks. A group project involving both individual and group reports, and a portfolio that is handed in twice during the module. The students with A levels performed significantly less well than other groups except those with AVCE qualification who achieved an average of 4.4 grade points lower on the module. The reason(s) for this are not clear, but it may be that weaker students see this module as an easier option than some of the more technical modules.

CP1054, Introduction to Computing and Programming, a year-long programming module has several assessment tasks. These comprise a portfolio, an application with documentation, a phase test and an end exam. Both the students with A levels and those with AVCE qualifications performed significantly worse than other students by some 4.4 grade points. This is the core programming module for students who are studying computing rather than those who are studying computer science; the latter course is considered to be more challenging. This would be supported by the results of CP1057, a year-long programming module and CP1056, both studied by those on computer science courses, where students with A levels have performed slightly better than others.

Whilst other results were not statistically significant, a consistent pattern across the eight modules of weaker performance by students with AVCE qualifications merits further investigation. It is known though that students do not have to pass all units in order to obtain an overall pass at AVCE. It may be that some students are achieving a pass when they may have failed fundamental units. It is also noted that students with A levels were only seen to perform well in two out of eight modules. This may be a reflection of the grades achieved at A level by our students.

Table 3. Effects of approaches to studying on module grades.

Module	N =	P value	Deep	Strategic	Surface
CP1052	43	.076	.16 (p= .026)	n/s	n/s
CP1056	73	.001	.15 (p< .000)	-.07 (p= .037)	n/s

Regression analysis of module grades and approaches to studying (Table 3) indicates no significant effects except that on CP1052, for every extra point on the deep approach scale, the module grade point increased by 0.16. Similar findings were seen on CP1056 where the module grade point was increased by 0.15 in the same way, but reduced by 0.07 of a grade point for every extra point on the strategic approach scale. The reasons for the deep approach findings are not clear though both modules include a portfolio in their assessment tasks and this requires students to re-engage with their work more frequently and so encourages a deeper approach to studying. Students may see electronic phase tests and portfolio as requiring a less strategic approach than paper-based assessments, though other reasons for this may emerge as the project progresses. Other analyses of module grades and approaches to studying produced results that were statistically not significant but will be repeated this year. Low student numbers on the database may be one reason for a lack of significance in the results.

Regression analysis was also used to investigate the relationship between approaches to learning and entrance qualification (Table 4).

Table 4. Approaches to studying in relation to entrance qualification.

Entrance qualification	Deep approach	Strategic approach	Surface approach
A levels	(n/s)	-7.8 (p=0.014)	(n/s)

AVCE	(n/s)	-(n/s)	5.4 (p=0.057)

From Table 4 it can be seen that students with A levels scored 7.8 less than others on the strategic approach scale and this was highly significant. The reasons for this finding need to be explored further. The students with AVCE qualification scored 5.408 points higher on the surface approach scale and this was just outside significance, but thought close enough to merit inclusion.

Conclusion.

The data on entrance qualifications, learning styles and results at level one have produced patterns indicating that students with an AVCE entrance qualification are at increased risk of poor performance on the eight modules examined. There is a need to investigate students' performance at AVCE more closely prior to admission to courses in HE. The performance of students with A levels is inconsistent and merits further investigation, possibly by points scores or subject areas. The results and information are to be used by SCIT to develop an intervention programme in order to improve the support given to SCIT students. The project findings are being made available to colleagues in the feeder colleges and to staff in SCIT in order to provide information and to obtain feedback. This feedback will enable the intervention programme to reflect the needs of both staff and students in its development.

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Appendix (xiv)

Transition to HE: the impact of perceptions of student and staff.
Paper published by CELT Learning and Teaching Projects
2003 – 2004 ISBN 0-9542116-4-2

Transition to HE:

the impact of perceptions of students and staff

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Background and Rationale

The aim of the project was to gain a fuller understanding of the perceptions of students entering undergraduate programmes in SCIT in order to improve the students' achievements on their course of study. The results have fed into an ongoing SCIT research programme, begun in 2002, that seeks to relate entrance qualification, feeder institution, learning style and a student's success in their first year in HE. That research had revealed that student perceptions, including their expectations, motivations and their view of task requirements, are a key rather than a contributory factor leading to student withdrawal. The information obtained is forming the basis of collaborative initiatives involving learner support, enhancement of teaching and changes to the induction period.

Tinto[i] in a fundamental US-based study, drew attention to the importance of self-perception, in terms of social and academic integration, to a student's determination to continue with a higher education course. Tinto's study was built on by Edward[ii] who emphasised the importance of the transition period and, in particular induction, in ensuring student commitment. His model describes perceptions and expectations of the course and profession (engineering) at pre-entry as influencing the degree of persistence exhibited by an individual. At post-entry, commitment to the university, engendered by a sense of belonging and influenced by perceptions of the institution, is highly significant in survival.

Several studies have been undertaken to assess student perceptions. Lizzio and Wilson[iii] evaluated student self-perceptions of their level of capability using a questionnaire with closed questions and a seven point scale. Maunder and Harrop[iv], in another quantitative study, examined differences in student and staff perceptions of the teaching process, using open questions to derive key factors, and then a closed questionnaire, where the factors had to be ranked. Hopkins and Smith[v], in a qualitative study, used focus groups and interviews to identify misconceptions of pre-entry English students about how their time will be apportioned on their course. They found that students grossly overestimate the amount of time they think they will spend with their tutor and in lectures and seminars, and underestimate the amount of time they will spend on personal research and reading.

The study reported herein utilised a narrative reporting process, focus groups and a questionnaire with open questions progressively to isolate significant issues to feed into an intervention programme.

The Research

To encourage the first year undergraduates in SCIT to reflect upon their academic performance, in History of Computing the students were asked to use an online reflective diary, or blog[i], to comment frankly upon their progress in the module. Since 1999 when blogs or web logs were first used to detail personal information and opinion, they have become established in business as a means of recording narrative knowledge: to gather employee opinion and to gain innovative ideas.[vivii] The comments harvested from the blogs in semester one were analysed to derive key issues. These issues coupled with hard data obtained from analyses of student performance linked to type of entrance qualification: A-level, AVCE, GNVQ etc., were utilised to derive a set of questions used in focus group discussions held with first year computing students in semester two. Despite extensive promotion by module leaders in core modules, by email and using posters mounted prominently in MU Block, and the offer of a free lunch, the attendance at the sessions was disappointingly low. However, it was sufficient to obtain a response which provided enough qualitative data on student thoughts and perceptions of their transition to HE to lead to the development of a questionnaire, based on open questions, delivered later in semester 2 to the whole first year undergraduate computing cohort, when they were pinned down in test sessions. The questionnaire is given below.

Student issues and ideas, good luck with your studies, thank you
7. What were the most difficult or stressful things during your change from attending school/college to studying at university? 8. What could we have done to make this better or easier? 9. What could have been done in school/college to prepare you better for university life? 10. What is the best thing about studying here? 11. What is the worst thing about studying here? 12. Do you have any sensible suggestions to make about first year issues?

The Outcomes

[i] www.blogger.com

Overall, the students had found the transition to HE difficult. They had been surprised by the intensity of the workload in HE; they had found their first assignment very stressful; they had had difficulty adapting to the change in teaching and learning style; they had found it difficult to organise their workload and to self-study; they had felt lost and reported physically getting lost.

Analysis of the blog comments led to the following groups of selected responses:

Feelings on first day Worried – would they succeed, had they made the right choice of course and place? Excited – eager to get started. Apprehensive – what are the other students and the lecturers like? Overwhelmed – lost in a sea of faces, buildings and instructions. Nervous – a huge university was in front of me.
Memories of the first day Too many pieces of paper to organise. Walking everywhere. Impressive computer facilities. Endless queues. The fire alarm going off. A helpful member of staff taking the time to sort me out.
Feelings now Glad taken the course. Still excited. Illness is a disaster as you get behind. Like hands-on, but not always enough computers, and too many students trying to attract the attention of the lecturer. Encouraged as the tutor said I had done my evaluation well. Evaluation is a good idea as it makes you look back. Teaching material here is well laid out.
Other points Good to know the deadlines and have them set out in first session. Concerned about leaving things until the last minute – causes stress. Filling in questionnaires helps the tutors to help the students.

Here is a selection of focus group observations:

- How do our methods of assessment differ from those you used in FE?
- *Deadlines more difficult. In college we were more prompted and it (the assignment/work) was broken into chunks.*
- What about class sizes, do they affect how you work?
- *They are bigger and rowdy; it's difficult to concentrate.*
- Do you think the way you do your learning has changed in HE?
- *Definitely, tighter deadlines (mature, A level).*
- *Not really, I take it in, remember it and spit it out for exams (AVCE).*
- *Much harder work here but better than college (overseas).*
- When you get a module guide, what do you read first?
- *Weighting of assignments.*
- What do you **not** bother to read in the guide?
- *All the rest.*
- Have you considered dropping out? If so, why?
- *Yes, when work piled up.*
- What made you stay?
- *My parents are proud of me being here.*

Two out of six sections of the grouped overall responses from focus groups and the questionnaire, relating to questions 1 and 2, are given below.

What were the most difficult or stressful things during your change from attending school/college to studying at university?
Intensity of workload
Timetable (lack of) and year timetable (terms etc)
Deadlines
First assignment – what was required; report writing

Big jump from 6^{th} form to HE work
Change in teaching and learning style
Tutors having less time
Welcome Week
Lack of information
Getting lost (site and building map needed)
Working environment
Lectures
Learning difficulties (dyslexia)
Finances
What could we have done or provided to make this better or easier?
Increased use of online notice boards for rooms, times, exams, timetables etc.
Ice breaker activities
Longer and more tutorials
More programming workshops
More direction signs in buildings
Pathway Guide sent out earlier
Slower change from FE to HE teaching
Better relating of workshops to lectures
Personal tutor introduction earlier
Early knowledge of university software used
Crowd control in lectures
Help with first assignment
Spread assignments better
Better explanation of programming and VB.net
More 1-2-1 tutorials

Benefits

This work has fed into the development and implementation of an intervention programme, which includes a student web-site, produced by a SCIT student for his final year project. The intervention programme also includes: changes to Welcome Week; changes to the personal tutor system; staff development to promote teaching styles which incorporate more active learning; consideration of changes to level 1 assessment; and methods to make students more aware of the university environment in the year before entry.

The project has led to a richer knowledge of student concerns. The students who participated have reported that they appreciate their opinions being taken on board. It is hoped that the changes will result in improved student retention in SCIT.

Evaluation

These findings were offered for discussion at a workshop at an international conference on student retention and achievement.[viii] They were well received and prompted a constructive debate about the issues.

Future developments

It is intended to evaluate the success of, and refine, the intervention programme. Further results will be published externally, which will provide feedback to the team.

Blogging warrants further investigation as a tool to aid student reflection.

It is hoped that this experience will prompt colleagues in the wider university community to continue to develop student-friendly ways of soliciting student feelings and opinions, which are then considered for incorporation into programmes of study.

Appendix (xv)

A comparison of pre-entry assessments in feeder colleges
with those of the first year degree programme.
Paper published in CELT Learning and Teaching Projects
2004 – 2005 ISBN 0-9542116-4-2

A Comparison Of The Nature Of Pre-Entry Assessment In FE Feeder Colleges With Those Of The First Year Degree Programme

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Background and Rationale

The aim of this research was to gain an understanding of the styles and content of assessment our students were used to receiving in their feeder Further Education (FE) institutions and hence the students' probable strengths and weaknesses with regard to assessment. Differences between the assessments they have been used to and those they encounter during the first year of their undergraduate programme in The School of Computing and Information Technology (SCIT) were analysed with the intention of identifying potential areas of difficulty experienced by our students.

Increasing participation in Higher Education (HE) has led to an increasing problem of first year failure and withdrawal. Zeegers and Martin (2001) found that incoming students were often poorly prepared for HE, and may not be willing to persist when they encountered difficulties. Ozga and Sukhanandan (1998) noted, however, that retention of students was not just a problem that could be tackled in tertiary institutions since the absence of university preparation and appropriate guidance in secondary education contributed significantly.

SCIT is conducting a three-year longitudinal case study using the action research model (Bassey, 1990) to identify students at risk of failure early in their course through an investigation of learning styles, entrance qualification, previous institution and personal details. Students are being tracked from the year prior to entry in six local feeder colleges, through levels one and two in HE. The project is in its third year and results so far have produced interesting patterns indicating, for instance, that students with an AVCE entrance qualification are at increased risk of poor performance, especially in modules with certain types of assessment regime. On the basis of all the findings it was considered important to research more fully the perception of pre-entry students as to what learning actually is. It is recognised that there are differences between student knowledge, expectations and starting point, and the anticipations that HE teaching staff have of those students. Indeed, HE teaching staff may have little knowledge of the outcomes of modern FE courses.

Through the medium of the SCIT FE Liaison Committee, SCIT staff are working with colleagues in FE to prepare students and overcome these prospective difficulties. This should improve student transition from FE to HE and thereby improve first year student retention. Taking account of assessment practices in FE will make assessment more relevant to our students and should improve its effectiveness, hence enhancing the quality of student learning. Insights gained from this research additionally will be useful in the development of foundation degrees.

As part of the longitudinal study, assignments at level one have been examined to provide greater information on which particular tasks or concepts the students have most difficulty with. The research presented here, which is outside the scope of the longitudinal study, complements that investigation and further illuminates the issue.

This report documents the findings of an initial survey of FE tutors, then outlines further work done using focus groups driven by the survey findings.

The Research

Opinions of FE staff teaching on courses preparing students for HE entry were gathered by means of an online questionnaire. Survey questions were intended to elicit the following information.

- What assessment methods are being used, formatively and summatively, individually and in groupwork.
- What the timescales and size of assignments are.
- How much support the students get with assessments.
- What deadline policies are in place.
- What coursework resubmission policies exist.
- To what extent there is a problem with plagiarism, collusion and cheating.
- Do FE tutors think their assessment strategies prepare students well for HE.

This information provided the basis for the focus group discussion questions. Two focus groups, both consisting of a mixture of representatives from FE and HE, were held during a one-day liaison workshop. The first concentrated on “The Language of Assessment”, which had been identified as a problem area during the initial survey. The second concentrated on an “Assessment Review” in which participants were supplied with a range of assessment material from FE and from level 1 of the Computing Degree Scheme. The aims of this session were to make tutors aware of the types of assessment students encounter and to try to identify both good practice and potential areas of difficulty.

Survey Outcomes

The survey on FE assessment uncovered the following:

- There appears to be twice as much formative assessment as summative assessment being used.
- The language of assessment appears to be an issue for concern.
- It is usual to allow work to be resubmitted.
- Portfolios and oral presentations are common.
- Assignments are, more often than not, large tasks.
- FE teaching staff are able to comment on whether they think students’ experience in FE will, or will not, prepare them for HE.

The ratio between formative and summative assessment was unexpected. There were several potential explanations for this. Firstly, staff from HE have underestimated the level to which students previously experienced formative assessment. Secondly, the FE tutors who participated in the survey had different interpretations of what was meant by summative and formative.

A group of FE tutors identified a problem with the language used in assessment in that they believed that their students did not understand assessments that were specified in traditional academic language. An important discussion topic for the proposed focus groups was to see how FE tutors could address this problem and to construct a set of guidelines that will be the starting point to develop this further within SCIT.

It is now common practice for students in FE to be allowed to resubmit work after it has been marked and feedback given. This is something that students do not encounter at University of Wolverhampton as it contravenes policy.

It has been identified that portfolios and oral presentations are common in FE. If similarities exist between these assessment methods and the portfolios and oral presentations experienced by undergraduates (i.e. if an FE portfolio is comparable to a HE one), students' success rates of portfolios and oral presentations could be compared with the success of undergraduate assessments that use techniques uncommon in FE.

Assignments used in FE are often large tasks. A misconception held within SCIT is that students who struggle to work independently on large tasks are inexperienced with them, and have common problems related to planning and time management. It was important to ascertain how large assessment tasks are successfully managed in FE and the level to which students are required to work independently. This would be a valuable contribution to developing independent learners.

The survey asked the FE tutors open-ended questions relating to whether they thought students' experience in FE would, or would not, prepare them for HE. All survey participants were able to supply substantial answers to this question. No participants admitted that they knew little of HE practice. This question was asked again, before and after the focus groups to see if perceptions had changed as a result of the work. This provided an indication of the existing levels of cross-sector awareness.

Focus Groups Outcomes

The following observations were made with respect to FE assessments:

- Assessments were issued right at the start of modules before any material had been delivered.
- Assessment criteria were very prescribed, in some cases running to three pages of bullet points.
- FE tended to use formative assessment leading up to summative assessment.
- Depending on the institution there were different policies regarding when coursework should be attempted. In some cases coursework should be done mainly outside taught sessions. At other institutions coursework should be completed entirely in tutor-supported sessions.
- Cheating was kept under control by the close, personal contact between students and tutors. Groups were small, consisting of 16 to 20 students and their contact with the same tutor was frequent, around three times per week, spanned across multiple modules.

- Predefined milestones were commonly used to help manage time. This effectively breaks large tasks down into multiple small ones, thus easing planning and control.
- At first sight, the volume and level of work is comparable to level 1 HND modules. Examples of students' work were not available at the discussion, thus this could not be fully confirmed. Similarly, the questions raised earlier about the content of portfolios and oral presentations were left unanswered.

The following observations were made with respect to HE assessments:

- A broad range of assessment methods were used.
- HE used formative assessment separately, with feedback given after summative assessment.
- The formalism and presentation of modules could be daunting. For example, module guides appeared to be part of quality procedures as opposed to being student-directed.
- Students did not appear to get much time to digest material before encountering assessment on it.

The Language of Assessment focus group acknowledged that there were cross-sector boundaries with language. The theory suggested earlier, relating to different tutors having different interpretations of key terminology, was found to be correct. For example, the group was asked what was meant by summative and formative and this started a debate. This served as evidence to support the need for more cross-sector collaboration. It became clear that the same generally used words imposed different expectations on students across the sectors. For example, the expected responses to questions centred on the words explain, describe and discuss, differ significantly in length. Guidelines exist for some FE assessments that indicate a *discuss* question should be answered with a 3 sentence response, whereas in HE a similarly worded question may require a substantial piece of work.

The following were proposed to address the problems:

- A common glossary needs to be developed.
- FE and HE need to be aware of differences in "real" exam papers.
- HE students need guidance on assessment and should be made aware of the differing expectations from FE to HE. For example, students could be told to analyse the ratio between the marks tariff and the time allowed for assessment to gauge the required level of answer.
- Cross-institutional online resources, via the Wolf Virtual Learning Environment may ease the transition.
- First year HE tutors could make more visits to FE to give "realism" talks.
- Staff could make informal visits to observe each other "in action".

Throughout the liaison day tutors from both sectors were informally asked about the level of knowledge they perceived themselves to have about the other sector. There appeared to be a consensus view that before the event they thought they knew more about the other sector than they actually did, and by learning more about the other sector through the course of the event they began to appreciate the actual differences.

Benefits and Evaluation

The research commenced under the premise that cross-sector awareness was low. This was substantiated both from the results of the survey but more so from the discussions arising from the focus groups. As well as being a vehicle for this research, the focus groups served as a starting point for engendering the required awareness to the extent of making direct immediate impact in practice. This should hopefully impact on the first year student experience.

Future Developments

There was a common agreement that there is a need for further collaboration and that an annual or bi-annual event would be desirable. Work will continue in the University-driven FE/HE liaison group. Opportunities to build on this work, particularly in the areas recommended by the focus groups, will be actively sought.

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Appendix (xvi)

Poster presented at the 8th annual conference on
Innovation and Technology in Computer Science Education.
2003 Thessaloniki, Greece

The Stepping Stones Project

Hilary Bentley, Dr. Jennifer Davies and Dr. Joanna Allan

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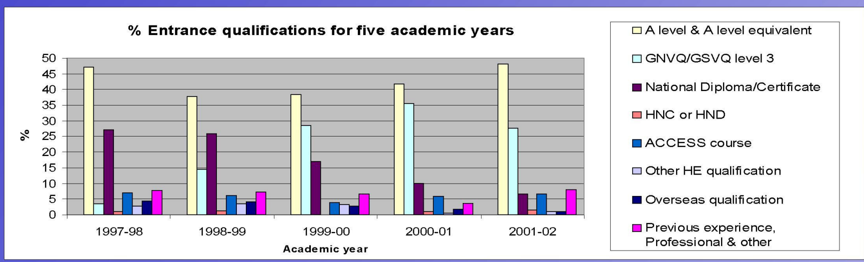
Introduction

Widening participation is bringing about major changes to the student profile in higher education (HE) institutions in the UK. Changes to enhance teaching and learning have been accelerated by the diverse needs of non-traditional students in the University of Wolverhampton. Changes need to be underpinned by detailed knowledge of those factors that are influential in determining a students chance of success. A longitudinal study is underway to investigate the influence of entrance qualification, feeder institution, learning style, skills and expectations on a student's chances of successful study. With the co-operation of seven local further education (FE) colleges a cohort of students is being tracked from their last year in FE, through years one and two in HE to investigate for patterns that may enable early identification of students at risk of failing. Intervention will be developed as the project progresses and constructive feedback will be offered to those FE colleges taking part in the project.

The graph below shows that more than 50% of students in the School of Computing and Information Technology do not have A levels or A level equivalents



Entrance qualification
- Content / structure
- Assessment regime
- Mode of delivery

Feeder institution
- Courses
- Ethos
- Staff development
- Student profile

Diagnostic tests on entry
- Communication
- Numeracy
- Library skills
- IT skills

Learning style
- Preferences
- Approach
- Teaching influence

Expectations & motivation
- 1st year vulnerability
- Family support
- Widening participation

Stronger collaboration with further education colleges
- Improved dialogue on student progression from FE to HE
- Improved information on HE course contents
- Improved information on HE course requirements
- Improved knowledge of FE course contents

Early detection of students at risk of failing
- Patterns may emerge that enable "at risk" students to be identified early in semester one

Academic outcomes
- What the students achieve at the end of their HE course of study

Feedback to further education colleges
- Information on the project findings will be offered to colleges.
- Colleges can use the information to support and prepare students better for HE study

Intervention.
- Changes to the way we teach, and deliver material
- Changes to assessment and student support
- Changes will be based on the initial findings of the project where level one results will be linked to knowledge of factors influential in retention, and FE factors

Staff development
- A key factor in the project
- Staff need to be involved in developing and implementing the intervention programme

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